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OFFICIAL GAZETTE

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PATENTS

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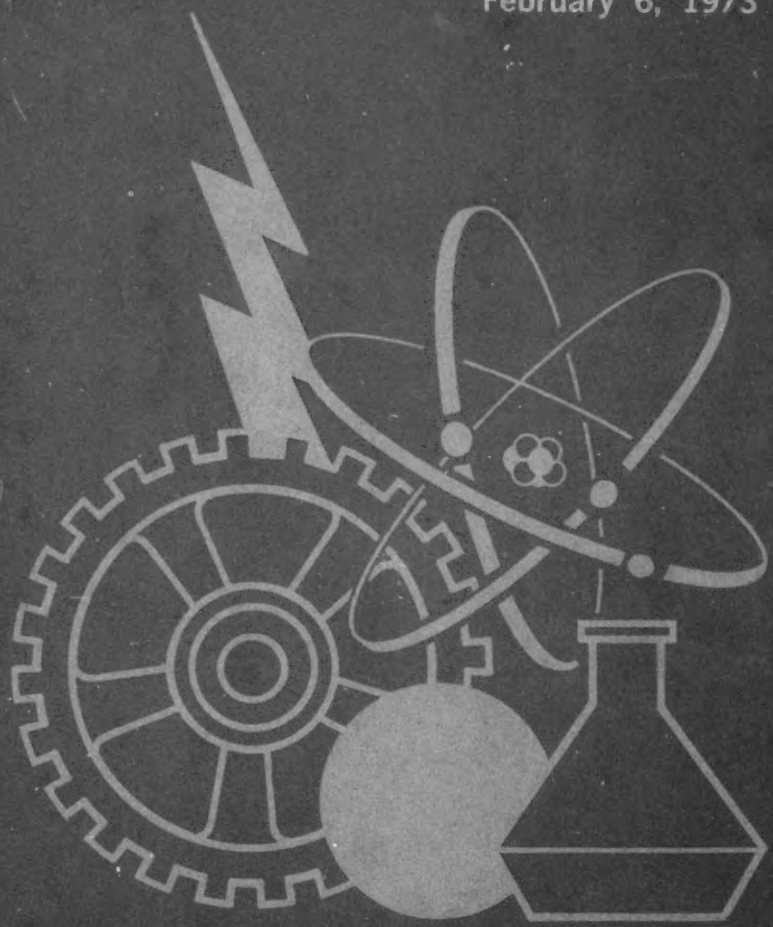

U. S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 6, 1973 Volume 907 Number 1

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PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of December 1972

Examiner affirmed	91
Examiner affirmed in part	10
Examiner reversed	27
Total	128

Office of the Secretary

[Dept. Organization Order 30–3A]

PATENT OFFICE

Organization and Functions

This order effective December 15, 1972, supersedes the material appearing at 27 FR 11469 of November 21, 1962.

Section 1. *Purpose.* This order delegates authority to the Commissioner of Patents and prescribes the functions of the Patent Office.

Sec. 2. *Status and line of authority.* .01 The Patent Office is hereby continued as a primary operating unit of the Department of Commerce. First established as an independent bureau under the direction of a Commissioner of Patents by the general revision of patent laws enacted by Congress July 4, 1836 (5 Stat. 117), it became a bureau of the Department of Commerce by Executive Order of April 1, 1925, in accordance with the authority contained in the act of February 14, 1903 (32 Stat. 830). When the patent laws were codified as Title 35, United States Code, effective January 1, 1953, the Patent Office was continued as an office in the Department of Commerce.

.02 The Commissioner of Patents (hereinafter called the Commissioner), who is appointed by the President by and with the advice and consent of the Senate shall be the head of the Patent Office. He shall be principally assisted by a Deputy Commissioner and four assistant commissioners, whose titles and status are specified below. The First Assistant Commissioner (Deputy Commissioner) and the first two assistant commissioners are provided for by 35 U.S.C. 3 and are appointed by the President by and with the advice and consent of the Senate.

a. The Deputy Commissioner (First Assistant Commissioner under 35 U.S.C. 3).

b. The Assistant Commissioner for Patents (an assistant commissioner under 35 U.S.C. 3).

c. The Assistant Commissioner for Trademarks (an assistant commissioner under 35 U.S.C. 3).

d. The Assistant Commissioner for Legal Affairs.

e. The Assistant Commissioner for Administration.

.03 The Deputy Commissioner or, in the event of a vacancy in that office, the assistant commissioner appointed under 35 U.S.C. 3 who is senior in date of appointment, shall act as Commissioner during a vacancy in that office until a Commissioner is appointed and takes office. In the absence of the Commissioner, the Deputy Commissioner shall act as Commissioner. If the Deputy Commissioner is likewise absent or that office is vacant, one of the assistant commissioners appointed under 35 U.S.C. 3 or the Assistant Commissioner for Legal Affairs or the Solicitor of the Patent Office shall act as Commissioner in an order of precedence prescribed by the Commissioner.

.04 The Commissioner shall report and be responsible to the Assistant Secretary for Science and Technology.

Sec. 3. *Delegation of authority.* .01 Pursuant to the authority vested in the Secretary of Commerce by 35 U.S.C. 3 and Reorganization Plan No. 5 of 1950, the functions of the Patent Office and its officers specified in Title 35 of the United States Code, as amended, are hereby vested in the Secretary of Commerce and redelegated to the Commissioner of Patents.

.02 Pursuant to the authority vested in the Secretary of Commerce by law, the Commissioner of Patents is hereby delegated authority to perform the following functions vested in the Secretary of Commerce.

a. The functions in Title 15, Chapter 22 of the United States Code, which pertain to trademarks.

b. The functions in Executive Order 10096 of January 23, 1950, and the Executive Order 10930 of March 24, 1961, which pertain to inventions made by Government employees.

c. The functions in 42 U.S.C. 2181 and 2182, which pertain to inventions relating to atomic weapons, and in 42 U.S.C. 2457, which pertain to property rights in inventions made in performance of work under contract for the National Aeronautics and Space Administration.

d. Such functions under other authorities of the Secretary of Commerce as are applicable to performing the functions assigned in this order.

.03 Exercise of the functions delegated in paragraphs .01 and .02 of this section shall be subject to such policies or directives as may be prescribed by the Secretary of Commerce or the Assistant Secretary for Science and Technology.

.04 The Commissioner of Patents may, except as precluded by law or regulation, redelegate his authority to employees of the Patent Office subject to such conditions in the exercise of the delegated authority as he may prescribe.

Sec. 4. *Functions.* The Patent Office shall perform the following functions:

.01 Examine applications for patent to determine if they meet the requirements of law for the issuance of patents and, upon such determination, granting patents.

.02 Administer special laws and regulations as to secrecy of certain inventions, licenses for foreign filing, and those relating to atomic energy and space technology.

.03 Decide the ownership of patents and the rights to inventions made by Government employees, as provided by Executive Orders 10096 and 10930.

.04 Provide for the publication, storage, dissemination, and exchange of patents and related documentation.

.05 Maintain systems and facilites providing appropriate access to United States and foreign patents and other technical literature for use of the examiners and the public.

.06 Examine applications for the registration of trademarks to determine their entitlement to registration under the law; give public notice of trademarks allowed for registration and publish registered trademarks; maintain the principal and supplemental registers of trademark registrations, and provide for public access to such registers and related trademark records.

.07 Issue patents and certificates of trademark registration.

.08 Reissue defective patents and issue certificates of correction of patents and trademark registrations.

.09 Maintain records as to proprietary interests in patents and trademarks and applications therefor.

.10 Carry on or authorize studies and programs, separately or in coordination with other United States, foreign, and international agencies, regarding domestic and international patent and trademark law.

.11 Perform other functions required, or which the Commissioner deems necessary and proper, in exercising the authority delegated herein.

Effective date: December 15, 1972.

GUY W. CHAMBERLIN, Jr.,
Acting Assistant Secretary
for Administration.

[FR Doc. 73–320 Filed 1–5–73; 8:45 am]

[Dept. Organization Order 30–3B]

PATENT OFFICE

Organization and Functions

This order effective December 15, 1972, supersedes the material appearing at 36 FR 9078 of May 19, 1971.

Section 1. *Purpose.* This order prescribes the organization and assignment of functions within the Patent Office. Department Organization Order 30–3A prescribes the scope of authority and functions.

Sec. 2. *Organization structure.* The principal organization structure and line of authority of the Patent Office shall be as depicted in the attached organization chart. A copy of the

organization chart is attached to the original document on file in the Office of the Federal Register.

SEC. 3. *Office of the Commissioner.* The Commissioner determines the policies and directs the programs of the Patent Office and is responsible for the conduct of all activities of the Patent Office. He is principally assisted by a Deputy Commissioner and four Assistant Commissioners who shall have the main duties as specified below:

a. The Deputy Commissioner (First Assistant Commissioner under 35 U.S.C. 3) shall assist the Commissioner in the direction of the Patent Office with immediate responsibility for the Office of Petitions and shall perform the duties of the Commissioner in the latter's absence.

b. The Assistant Commissioner for Patents (an assistant commissioner under 35 U.S.C. 3) shall provide administrative and policy direction for the patent examining and related operations which consist of the organizational elements enumerated in section 5 of this order. He is assisted by a Deputy Assistant Commissioner who shall, among other duties, have immediate responsibility for the patent examining groups and shall perform the duties of the Assistant Commissioner during the latter's absence.

c. The Assistant Commissioner for Trademarks (an assistant commissioner under 35 U.S.C. 3) shall provide administrative and policy direction to the trademark registration and related operations which consist of the organizational elements enumerated in section 6 of this order.

d. The Assistant Commissioner for Legal Affairs shall be the chief law officer of the Patent Office and as applicable shall provide administrative and policy direction to the organizational elements enumerated in section 7 of this order. Pursuant to Department Organization Order 10–6, he shall be subject to the overall authority of the Department's General Counsel with respect to legal and legislative matters involving the Patent Office, other than in connection with the issuance of patents or the registration of trademarks.

e. The Assistant Commissioner for Administration shall be the principal advisor to the Commissioner on the formulation and application of management policies and shall provide administrative, management, and operational support services to components of the Patent Office. In addition, he shall provide administrative and policy direction to a staff assigned to his office as well as to the organizational elements enumerated in section 8 of this order. He shall be assisted by a Deputy Assistant Commissioner who shall perform the duties of the Assistant Commissioner during the latter's absence.

SEC. 4. *Offices reporting to the Commissioner.* .01 The Offices of Petitions shall receive, docket, maintain records, and take other appropriate action with respect to petitions to the Commissioner submitted under applicable law and regulations; assign petitions to appropriate officials for decision or recommend and prepare decisions for review and approval by the Deputy Commissioner; and recommend changes in office policy, practices, and procedures, where the need for such appears evident from the records of the office.

.02 The Office of Government Inventions and Patents shall administer Executive Order 10096, as amended by Executive Order 10930 and related regulations, including the rendering of final decisions on the ownership of patents and the rights to inventions made by Government employees, and advise the Commissioner on matters involving the Committee on Government Patent Policy (of the Federal Council for Science and Technology). It shall also conduct research, liaison, and coordinate functions needed to carry out Executive Order 10096 and to advise the Commissioner on Committee matters; provided executive secretariat support to the Committee; and assist in the development and formulation, to the extent appropriate, of a uniform Government-wide policy.

.03 The Office of Advanced Systems Development shall apply analytical basic research techniques to the development of new machine-assisted experimental search, retrieval, and display systems; to the exploration and application of advanced technology for the betterment of operating systems; and to increasing the effectiveness of technical information dissemination and accessing measures. This work is directed primarily to providing solutions to hitherto unresolved problems and to the development of experimental or test applications, or simulations of original techniques or operations. It shall assist in the installation, pilot use, and evaluation of experimental systems in operating environments.

.04 The Office of Information Services shall advise and represent the Commissioner on information matters; conduct programs fostering public understanding of the American patent system and the functions, services and administrative publications of the Patent Office; develop publication policies; provide direction and assistance in developing new and revised publications; and assure conformity with policies, regulations, and standards concerning publications and publication practices.

SEC. 5. *Offices reporting to the Assistant Commissioner for Patents.* .01 The Office of Patent Program Control shall develop procedures for and establish quality, quantity, and other performance standards relating to the conduct of the patent examination and classification functions; establish program activity targets and continually evaluate status against program objectives; provide training to examiners in patent practices and procedures; and monitor compliance with examination and classification standards and procedures.

.02 The Office of Patent Classification shall develop, implement, and maintain subject matter classification systems for patent search files of prior art; evaluate and adapt experimental or other search systems developed elsewhere; determine requirements for and initiate procurement of foreign patent and literature abstracting services for use by examiners; and provide technical specifications, guidance, advice, and assistance to the contracting officer in such procurements; coordinate the classification of U.S. and foreign patent documents and nonpatent literature; and participate in developing and fostering harmonization of the United States and the International Patent Classification systems.

.03 The Examining Groups shall examine applications for patents to ascertain if the applicants are entitled to patents under the law and grant patents to those so entitled. Each examining group shall perform this function for patent applications falling within the generic category assigned to it. The number of examining groups and the coverage of the generic categories shall be determined by the Commissioner.

SEC. 6. *Offices reporting to the Assistant Commissioner for Trademarks.* .01 The Office of Trademark Program Contol shall develop guidelines governing trademark examining procedures; establish program activity targets and continually evaluate status against program objectives; and provide instruction in trademark practice and procedures and coordinate trademark administrative support activities.

.02 The Trademark Trial and Appeal Board shall be responsible for hearing and deciding adversary proceedings involving interfering applications, oppositions to registration, cancellations, and concurrent use proceedings; and for hearing and deciding appeals from final refusals of the trademark examiners to allow the registration of trademarks.

.03 The Trademark Examining Operation shall be responsible for the classification of trademark applications into classes of goods and services, the examination and processing of these applications, and the registration of trademarks, service marks, and certification marks; and maintain the principal and supplemental registers of trademarks.

SEC. 7. *Offices reporting to the Assistant Commissioner for Legal Affairs.* .01 The Office of the Solicitor shall handle all litigation to which the Commissioner is a party and provide other legal services, including advice and assistance on legislative matters, and maintenance of the law library.

.02 The Examiners-in-chief sitting as a Board of Patent Appeals shall be responsible for hearing and deciding appeals from adverse decisions of examiners upon applications for patents.

.03 The Board of Patent Interferences shall conduct patent interference proceedings and make final determinations in the Patent Office as to priority of invention. The Board shall also hear and decide questions concerning property rights in inventions in the atomic energy and space fields brought before it under the provisions of sections 2182 and 2456 (d) and (e) of title 42, U.S.C.

.04 The Office of Legislation shall develop recommendations and advise policy and action concerning matters which may require changes in the patent and trademark laws; review and prepare analysis of bills or drafts of legislation concerning patent or trademark matters received for technical appraisal; prepare legislative proposals and, after appropriate clearance, draft legislation and supporting documentation for clearance with the Department's Office of the General Counsel and the Office of Management and Budget, for consideration by the Congress; and maintain liaison with

patent and trademark bar associations, industry, and others concerned with proposed and pending legislation.

.05 The Office of International Affairs shall coordinate the development of policy and program recommendations or positions respecting international patent and trademark affairs, including all proposed new or modified agreements under the Paris Union, Patent Cooperation Treaty, or like treaties; maintain liaison in such matters with the Office of the Secretary, the Department of State, and concerned elements of the public; and participate in negotiating patent and trademark matters in establishing international agreements and in the implementation of programs affecting Patent Office commitments or responsibilities in these areas.

SEC. 8. *Offices reporting to the Assistant Commissioner for Administration.* .01 Management Planning Organizations:

a. The Office of Budget shall formulate, interpret, and execute budgetary and fiscal policies; establish and maintain a comprehensive budget program collaborating with cost center officials in developing budget and fiscal plans; develop and present budget requests; allocate and maintain budgetary accountability of available funds; maintain external liaison in budgetary matters; and review and evaluate the fulfillment of budget-based program commitments.

b. The Office of Management and Organization shall plan and conduct studies designed to improve organization, methods, procedures, workflow, work measurement, managerial techniques, and resource utilization, or otherwise increase efficiency, effectiveness and economy of operations; develop and manage a system for the issuance of internal administrative orders and instructions; promote development of the Patent Office management improvement program and coordinate the collection, review and submission of reportable plans and accomplishments thereon; coordinate a program for the management and control of external reports; and make special studies as required.

c. The Office of Program Planning and Evaluation shall formulate plans for and coordinate the development of Patent Office-wide long and short range program objectives within the framework of budgetary constraints; define, project, and allocate the manpower and other resources required to achieve Patent Office-wide objectives; develop and monitor a management information system which prescribes code structures for and consolidates all administrative management systems into a single integrated data base to provide information designed to measure performance and achievement against planned objectives; and develop and issue a wide variety of timely internal analytical and interpretive reports to the managers of the Patent Office.

.02 Public service organizations:

a. The Office of Publications shall schedule and manage the processing and movement of allowed patent application files in procuring the creation of full patent text machine language data base and the composition and printing of weekly patent issues and related announcements in the OFFICIAL GAZETTE; provide requisition and scheduling services for trademark publications; monitor the quality or performance by contributing sources and maintain close liaison with U.S. Government Printing Office; and prepare and issue patent grants and periodic publications of patent indexes.

b. The Office of Patent and Trademark Services shall provide the materials and services offered directly to the public, many of which are provided on a fee basis. These shall include recording instruments that transfer property rights to patents and trademarks; furnishing copies of patents, trademarks registrations, and office records to examiners and others in the Office, as well as to the public; providing drafting services; and maintaining appropriate collections of pertinent technical and scientific information such as United States and foreign patents, periodicals, books, and other publications for use by the public. It shall also conduct an initial examination of patent applications for compliance with law and regulation as to form and certain matters of factual content; grant or deny a filing date based on such examination and forward to the Examining Groups those granted a filing date; acknowledge the acceptance or rejection of applications for examination; originate documentation of pending applications; initially assign accepted applications to units of the examining groups for examination; and maintain records on the status and location of all applications.

.03 Administrative service organizations:

a. The Office of Computer Services shall be responsible for providing data processing services to other elements of the Patent Office. This shall include the conduct of systems analysis and equipment evaluation studies directly related to the design and development of systems and programs for applications of computer techniques; preparation or procurement and testing of computer programs, and supplemental data processing services; operation of all general purpose ADP equipment including that which may be approved for use within another organization unit as an integral part of its operations; and maintenance of a comprehensive library of programs, including those developed or procured by other organization units.

b. The Office of Finance shall develop and maintain the financial accounting system of the Patent Office, perform accounting operations for the revenue, trust funds, and appropriation of the Patent Office, including maintenance of general accounts and related fiscal records, preparation of financial statements and reports, audit and certification of vouchers for payment, issuance of deposit account statements, initiation of action to collect amounts due the Patent Office, and administration of the payroll system and related employee accounts; and provide financial advice and opinions.

c. The Office of General Services shall plan and administer a broad Office-wide program of general services, including procurement control; property, space, and facilities management; communications, records, files, mail, and forms management; administrative printing; and clearance of all requirements involving contractual procurements, including liaison with the Department, in connection therewith.

d. The Office of Personnel shall administer activities relating to recruitment, placement, employee relations, equal employment opportunity programs for employees, training and career development, incentive awards, performance rating, position classification and wage administration, group-management relations, and various employee benefit programs.

.04 The Office of Technology Assessment and Forecast shall continually assess the status of technological activities in all countries; compare inventive activity in the United States relative to other nations; and forecast developments on a world-wide basis.

Effective date: December 15, 1972.

GUY W. CHAMBERLIN, JR.,
Acting Assistant Secretary for Administration.

[FR Doc. 73-321 Filed 1-5-73; 8:45 am]

Published in 38 F.R. 1068, Jan. 8, 1973

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,741,416, G. W. Hileman, CONTAINER; 3,269,640, E. L. Arneson, same; 3,411,692, E. G. Mathews, same, filed May 4, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1117, *Federal Paper Bd. Co. Inc.* v. *Field Container Corp.*

2,947,104, Johnson and Johnson, WATER FOWL DECOY; 3,010,245, F. R. Conibear, TRAPS, filed Oct. 26, 1967, D.C. Minn. (St. Paul), Doc. 2-67-297-C, *Woodstream Corporation* v. *Herter's Inc. and George L. Herter.* Judgment in favor of the defendants, the two patents being declared invalid. In the above action the U.S. Court of Appeals reversed the judgment with regard to the finding of invalidity of the Conibear patent, and affirmed the judgment in all other respects. This was done by mandate received here Sept. 27, 1971. On Aug. 4, 1972, Judge Devitt entered judgment that U.S. Letters Patent No. 3,010,245 is valid, enjoined defendants from making or selling the trap involved.

3,010,245. (See 2,947,104.)

3,046,056, Greene and Pulley, SEAT BELT PROTECTOR BOOTS; 3,126,228, same, TWIN HOOK TYPE VEHICLE SAFETY BELT AND GUARD BOOT THEREFOR; 3,171,688, A. S. Nicholas, RECEIVER FOR SEAT BELT RETRACTOR; 3,272,557, A. S. Nicholas, same; 3,287,061, same, HOLDER FOR SEAT BELTS; 3,287,063, same, RETRACTOR HOUSING; 3,291,526, same, GUARD FOR VEHICLE SAFETY BELTS; 3,305,266, Nicholas and Fuerst, SEAT BELT TERMINAL JACKET; 3,313,574, A. S. Nicholas, RECEIVER FOR BELT RETRACTORS; 3,318,634, same, SEAT BELT UNIT; 3,401,980, same, HOUSING WITH PLATE ANCHOR; 3,550,955, Nicholas and Chamberlain, SEAT BELT TERMINAL JACKET; 3,455,-603, A. S. Nicholas, SEAT MOUNTED RETRACTOR HOUS-

ING, filed May 10, 1972, D.C., E.D. Mich. (Detroit), Doc. 38286, *Gateway Industries, Inc.* v. *U.S. Industries, Inc.*

3,675,781, Atkinson, Cline and Cunningham, BEARING SEAL, filed Feb. 14, 1969, D.C., S.D. Tex. (Houston), Doc. 69–H–153, *Hughes Tool Company* v. *Reed Roller Bit Company (now G. W. Murphy Industries, Inc)*. Judgment, patent is valid, defendant has infringed and is enjoined, Aug. 7, 1972.

3,689,212, Graham, Smith and Morriss, PIPE CLAMP, filed July 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1742–ALS. *Smith-Blair, Inc.* v. *R. H. Baker & Co.*

3,693,177, J. P. Villo, THREAD LOCK AND METHOD OF MAKING THE SAME, filed Aug. 7, 1972, D.C., N.D. Ohio (Cleveland), Doc. 72–825, *Standard Pressed Steel Co.* v. *Amerace Esna Corporation.*

3,695,309, Zeblisky, McCormack, Williamson and Schneble, ELECTROLESS COPPER PLATING, filed Apr. 21, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–971–EC, *Kollmorgen Corporation* v. *Dynachem Corporation.* Consent judgment, plaintiff is exclusive licensee under at least one of the claims of said patent, have been infringed by Dynachem Corp., Aug. 8, 1972.

3,100,080, R. A. Fiechter, RAILWAY RAIL JOINT; 3,139,364, same, METHOD OF MAKING RAILWAY TRACK, filed July 6, 1972, D.C., W.D. Pa. (Pittsburgh), Doc. 72–558, *Allegheny Drop Forge Company* v. *Portec, Inc.*

3,115,647, W. M. Emery, CUSHIONS; D. 197,397, same, PILLOW, filed June 20, 1972, D.C., Md. (Baltimore), Doc. 72–634–HM, *Better Sleep, Inc.* v. *Triangle Manufacturing Co., Inc.*

3,126,228. (See 3,046,056.)

3,139,364. (See 3,100,080.)

3,171,688. (See 3,046,056.)

3,184,556, W. K. Larkin, MINIATURE HEADSET-MICROPHONE ADAPTED FOR USE WITH A MASK; 3,548,118, K. J. Hutchings, SELF-SUPPORTING HEADSET; D. 218,173, same, COMBINED MICROPHONE AND RECEIVER INSTRUMENT, filed Apr. 20, 1972, D.C., S.D.N.Y., Doc. 72–C–1625, *Pacific Plantronics* v. *Roanwell Corporation.*

3,191,956, A. Rizzuto, WHEELED SHOPPING CART OR BASKET, filed Aug. 10, 1972, D.C., S.D.N.Y., Doc. 72–C–3399, *Bernard A. Guadano, Jr.* v. *Feneral Home Products Corporation and Laskey & Odette, Inc.*

3,239,145, A. D. Russo, DISPENSING CONTAINER FOR AIR TREATING GEL, filed July 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1748–AAH, *Blue Cross Laboratories* v. *Airwick Industries, Inc.*

3,269,640. (See 2,741,416.)

3,272,557. (See 3,046,056.)

3,287,061. (See 3,046,056.)

3,287,063. (See 3,046,056.)

3,291,526. (See 3,046,056.)

3,293,203, G. F. Paulus, THERMOSETTABLE RESIN COMPOSITIONS AND METHOD FOR FORMING LOW FRICTION SURFACE COATINGS, filed Aug. 9, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1836 WPG, *Acheson Industries, Inc.* v. *Drilube Company.*

3,305,266. (See 3,046,056.)

3,313,574. (See 3,046,056.)

3,318,634. (See 3,046,056.)

3,359,116, L. L. Little, METHOD OF PREPARING ACIDIFIED DAIRY PRODUCTS; 3,378,375, same, PROCESS OF MAKING SOUR CREAM TYPE PRODUCTS AND CREAM CHEESE, filed Dec. 1, 1971, D.C. Del. (Wilmington), Doc. C–4285, *Diamond Shamrock Corp.* v. *The Battelle Development Corp.*

3,362,829, Landfried and Moneymaker, COATED DRY GLUTEN PRODUCTS AND PROCESS FOR PREPARING SAME, filed May 9, 1972, D.C. Conn. (New Haven), Doc. 15022, *Top-Scor Products, Inc.* v. *Maurice R. Haney, doing business as M. R. Haney Co.* Consent judgment, July 28, 1972. Plaintiff is owner, an injunction is granted, awarded and decreed to plaintiff against defendant.

3,375,227, D. D. Hicks, CARBOXY-HYDROXY-CONTAINING COPOLYMERS; Re. 27,151, same, filed Apr. 21, 1972, D.C. Md. (Baltimore), Doc. 72–409–B, *PPG Industries, Inc.* v. *Celanese Coatings Company.*

3,376,388, M. G. Reiffin, DIRECT-CURRENT-COUPLED TRANSISTOR POWER AMPLIFIERS; 3,495,181, same, TRANSISTOR POWER AMPLIFIER WITH PROTECTIVE CIRCUITRY; filed July 24, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1812, *Martin G. Reiffin* v. *Heathkit Electronic Center, Heath Co. and Schlumberger Limited.*

3,378,375. (See 3,359,116.)

3,393,838, M. J. Syverson, STORAGE CONTAINER AND DISPENSER; D. 215,259, same, BEVERAGE DISPENSER, filed Feb. 28, 1972, D.C., S.D. Tex. (Houston), Doc. 72–H–258, *Fountain Industries, Inc.* v. *Consolidated Chemical Corp.*

3,401,980. (See 3,046,056.)

3,411,692. (See 2,741,416.)

3,455,603. (See 3,046,056.)

3,469,557, D. L. Wollard, CHANNEL STERN POWER BOAT; 3,518,604, Beaver and Van Benthuysen, ELECTRICAL COMPONENT, filed May 19, 1972, D.C., S.D. Fla. (Miami), Doc. 71–5–C–WM, *Penn Yan Boats, Inc.* v. *Sea Lark Boats, Inc. et al.* Judgment, patent is valid, defendant is owner, plaintiff, Penn Yan Boats, Inc. has infringed, June 6, 1972.

3,495,181. (See 3,376,388.)

3,518,087. (See 3,469,557.)

3,538,389, Levesque and Harper, SUBELEMENT FOR ELECTRONIC CIRCUIT BOARD, filed May 4, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1086–CC, *Circuit Stik, Inc.* v. *International Rectifier Corp.* Judgment and ordered thereon that plaintiff's claim is dismissed that defendant's counterclaims are dismissed, July 26, 1972.

3,548,118. (See 3,184,556.)

3,550,955. (See 3,046,056.)

3,673,410, Waite and Nodine, METHOD OF EXAMINATION OF CELL SAMPLES USING A RADIOACTIVELY TAGGED DYE; 3,678,148, L. Caiola, ANALYSIS OF RADIOACTIVE SLIDE SPECIMEN AND METHOD OF PREPARATION, filed Aug. 4, 1972, D.C.N.J. (Trenton), Doc. C–1341–72, *Isomedics, Incorporated and Information Utilization Corporation* v. *Bio-Digital Sciences, Inc.*

3,678,148. (See 3,673,410.)

Re. 27,151. (See 3,375,227.)

D. 197,397. (See 3,115,647.)

D. 214, J. A. Goodall, BATHTUB; D. 219,874, same, filed Aug. 10, 1972, D.C., S.D. Tex. (Houston), Doc. 72–H–1068, *Walker Marble Company, Inc.* v. *Kenneth Veach, doing business as KV Tile & Marble Company.*

D. 215,259. (See 3,393,838.)

D. 218,173. (See 3,184,556.)

D. 219,874. (See D. 214,902.)

Certificates of Correction for the Week of Feb. 6, 1973

D. 223,178	3,645,972	3,673,574	3,685,530
3,141,105	3,646,595	3,673,921	3,685,683
3,295,570	3,647,464	3,674,784	3,685,779
3,384,986	3,647,990	3,675,370	3,685,940
3,489,751	3,648,618	3,675,773	3,686,076
3,539,338	3,651,421	3,676,161	3,686,382
3,558,081	3,652,886	3,676,204	3,686,868
3,573,527	3,655,992	3,676,347	3,686,869
3,575,970	3,656,951	3,676,839	3,687,004
3,577,345	3,657,244	3,676,860	3,687,052
3,582,884	3,657,875	3,678,017	3,687,148
3,595,886	3,660,186	3,678,117	3,687,247
3,597,584	3,660,306	3,678,180	3,687,269
3,598,899	3,660,380	3,678,274	3,687,544
3,609,167	3,660,396	3,678,509	3,687,615
3,611,964	3,660,640	3,678,533	3,687,707
3,612,800	3,660,869	3,678,621	3,687,730
3,615,325	3,661,352	3,679,750	3,687,884
3,617,234	3,661,903	3,679,927	3,687,888
3,617,431	3,662,652	3,679,981	3,687,891
3,617,787	3,662,809	3,680,080	3,688,333
3,619,076	3,663,239	3,680,261	3,688,453
3,619,462	3,664,629	3,680,409	3,688,998
3,620,978	3,665,017	3,681,491	3,689,016
3,621,577	3,665,039	3,681,707	3,689,487
3,622,294	3,665,743	3,681,824	3,690,927
3,623,020	3,666,413	3,682,131	3,691,072
3,624,316	3,666,457	3,682,633	3,691,334
3,625,613	3,666,789	3,682,942	3,691,579
3,629,463	3,667,237	3,682,963	3,692,017
3,630,979	3,667,958	3,683,120	3,692,138
3,631,355	3,668,403	3,683,121	3,692,417
3,632,491	3,669,727	3,683,626	3,692,553
3,632,538	3,669,877	3,683,797	3,692,582
3,635,825	3,670,057	3,683,828	3,692,684
3,636,443	3,671,492	3,684,055	3,692,867
3,637,386	3,671,545	3,684,066	3,692,893
3,637,535	3,672,105	3,684,071	3,693,512
3,638,133	3,672,825	3,684,186	3,694,175
3,638,433	3,672,950	3,684,320	3,694,502
3,641,164	3,672,997	3,684,515	3,695,108
3,644,051	3,673,164	3,884,545	3,696,648
3,644,756	3,673,274	3,685,055	3,696,870
3,645,545	3,673,410	3,685,202	3,698,255
3,645,789	3,673,519	3,685,346	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,402,205, George P. Gregory, POLYPEROXIDES, decided August 30, 1972, Interference No. 96,742, claim 2.

Patent No. 3,432,468, Rudolf Gabler, HEAT-RESISTANT POLYTHIOETHERS AND METHOD FOR THEIR PRODUCTION, decided February 15, 1972, Interference No. 97,704, claim 4.

Patent No. 3,446,915, Raymond C. Volge, CATHODE RAY TUBE BEAM BLANKING CIRCUIT, decided November 16, 1972, Interference No. 97,465, claims 1(m) and 5(m).

Patent No. 3,453,762, Robert D. Fremont, DISPOSABLE MAGAZINE HAVING A PROTECTIVE COVER AND FOLLOWER RETAINING MEANS, decided September 22, 1972, Interference No. 97,354, claim 9.

Patent No. 3,461,003, Don M. Jackson, Jr., METHOD OF FABRICATING A SEMICONDUCTOR STRUCTURE WITH AN ELECTRICALLY ISOLATED REGION OF SEMICONDUCTOR MATERIAL, decided August 24, 1972, Interference No. 97,433, claims 7 and 8.

Patent No. 3,472,944, P. H. Morton and A. C. Barber, ASSEMBLIES OF SUPERCONDUCTOR ELEMENTS, decided August 20, 1972, Interference No. 97,170, claims 1, 2, 4, 5, 7 and 8.

Patent No. 3,484,413, Marvin L. Kaufman, POLYURETHANES PREPARED FROM THE CYCLIZATION PRODUCT OF A POLYGLYCIDYL CARBAMATE, decided October 12, 1972, Interference No. 97,650, claims 1(m), 2(m), 3(P), 4(m), 5(m), 6(m), 7(m), 8(P), 9(P), and 10(P).

Patent No. 3,496,135, Stanley W. Caywood, Jr., CRUDE EPDM COPOLYMER STABILIZED WITH A LEWIS BASE, decided November 2, 1972, Interference No. 97,453, claims 1(P), 2(P), 4(P), 6(P), and 8(P).

Patent No. 3,565,846, H. Enders, W. Dantanello, G. Pusch and S. Adolph, AGENT FOR MAKING TEXTILES CREASE PROOF AND TEXTILES TREATED BY SUCH AGENT, decided November 8, 1972, Interference No. 97,974, claims 1, 2, 3, 4, 6, 7 and 10.

Patent No. 3,522,950, Robert C. Schenck, Jr., PISTON AND PTFE RING ASSEMBLY FOR INTERNAL COMBUSTION ENGINES, decided August 31, 1972, Interference No. 97,741, claims 1, 2, 3, 4, 5 and 6.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 23, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-10-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-12-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-31-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-21-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-26-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	4-29-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-01-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-18-71

Expiration of patents: The patents within the range of numbers indicated below expire during January 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,733,439 to 2,736,897, inclusive
Plant Patents..... Number 1,456

REISSUES

FEBRUARY 6, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,569
CARDIAC ELECTRODE CATHETER AND HEART STIMULATION METHOD

Bernard Ackerman, Metuchen, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.

Original No. 3,485,247, dated Dec. 23, 1969, Ser. No. 480,020, Aug. 16, 1965. Application for reissue Aug. 27, 1970, Ser. No. 67,406

Int. Cl. A61n *1/04*

U.S. Cl. 128—418 14 Claims

A bipolar catheter includes an outer conductor and an inner conductor located inside the outer conductor and insulated therefrom except at the outermost portion. The outer conductor is divided intermediate its length and the two portions from the terminals of the catheter. The catheter is inserted in the heart by puncturing the patient's chest wall and heart with a needle and threading the catheter therethrough, after which the needle is removed and the catheter is connected to a suitable electrical impulse generator.

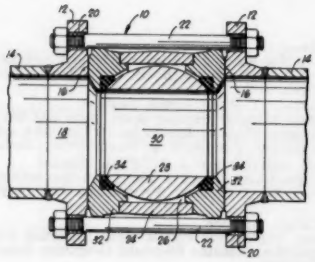
27,570
BALL VALVE FOR USE BETWEEN FLANGES

Domer Scaramucci, Oklahoma City, Okla., assignor to Balon Corporation, Oklahoma City, Okla.

Original No. 3,462,118, dated Aug. 19, 1969, Ser. No. 658,667, Aug. 7, 1967. Application for reissue Aug. 19, 1970, Ser. No. 65,205

Int. Cl. F16k *5/06, 51/00;* F16l *19/02*

U.S. Cl. 251—151 11 Claims



A ball valve for use between standard ASA flanges, wherein the body of the valve is shaped to accommodate the bolts connecting the flanges without interference, and is of the maximum internal diameter consistent with the provision of a seal no greater in diameter than the seating faces of the flanges, whereby the maximum size of valve ball can be used to maximize the flow capacity of the valve. The valve body is supported by retaining rings at each end which engage the flanges and transmit a compressive load from the flanges to the body, as well as for carrying upstream and downstream seals in positions to sealingly engage the valve ball.

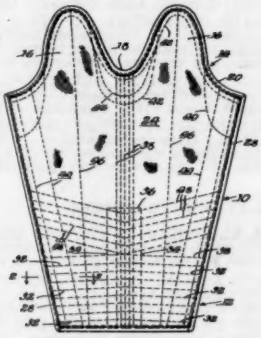
27,571
SURGICAL DRESSING

James F. Graham, 9760 S. Kedzee Ave., Evergreen Park, Ill. 60642

Original No. 3,521,632, dated July 28, 1970, Ser. No. 776,340, Nov. 18, 1968. Application for reissue July 1, 1971, Ser. No. 159,073

Int. Cl. A61l *15/00*

U.S. Cl. 128—156 14 Claims



A surgical dressing which is adjustable for size and shape. An inner lining of non-adhering fluid-permeable fabric is roughly shaped to conform to the human trunk. A congruent mass of fluid-absorbent material is superimposed on the inner lining, and covered with an outer lining of moisture-resistant fabric. All three layers are fastened together about their contiguous edges with a fabric tape. A plurality of spaced lines of stitching are provided through the outer lining and the mass of absorbent material. The stitching lines permit cutting of the dressing to size and shape without disturbing the structural integrity of the absorbent mass.

27,572
DIATOMACEOUS SILICA PIGMENTS AND THE LIKE

Clifford William Cain, Jr., Bound Brook, and Donald Earl Brody, Verona, N.J., assignors to Johns-Manville Corporation, New York, N.Y.

Original No. 3,499,778, dated Mar. 10, 1970, Ser. No. 596,119, Nov. 22, 1966. Application for reissue May 15, 1970, Ser. No. 37,942

Int. Cl. C09c *1/28*

U.S. Cl. 106—288 B 3 Claims

A diatomaceous silica flatting agent capable of imparting both a high level of smoothness and a low level of

60 degree gloss and 85 degrees sheen to various paints, the flatting agent being characterized by not more than about 5 percent diatomaceous silica coarser than about 10 microns, by a least 80 percent between about 2 and about 10 microns, and not more than about 15 percent smaller than about 2 microns, the particle sizes being the equivalent Stokes diameters obtained by a sedimentation test using the conventional Klein hydrometer technique.

27,573

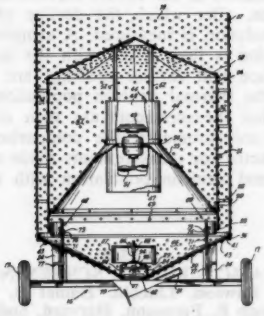
MACHINE AND METHOD FOR DRYING

Joseph B. Kucera, Traer, Iowa, assignor of a fractional part interest to Rudolph L. Lowell, Des Moines, Iowa

Original No. 3,524,264, dated Aug. 18, 1970, Ser. No. 785,651, Dec. 20, 1968. Application for reissue Nov. 8, 1971, Ser. No. 196,716

Int. Cl. F26b *7/00*

U.S. Cl. 34—20 **12 Claims**



The grain drier is adapted for continuous or batch drying and includes a portable frame that carries upright inner and outer grain receiving passage. Secured to the lower end of the outer wall is a downwardly converging perforated cooling wall having a centrally disposed dried grain outlet. The lower end of the inner wall is spaced upwardly from the lower end of the outer wall so as to form with the cooling wall a circular outlet for the grain passage. Drying air is drawn upwardly through the cooling wall and within the space defined by the inner wall, where it is heated and passed through the grain passage over the full length of such passage. The rate of flow of grain from the passage onto the cooling wall is controlled in accordance with predetermined drying requirements so tha tonly grain of substantially uniform moisture content is discharged through the dried grain outlet.

27,574

BLOWBACK SEAL FOR BUILDING PANELS

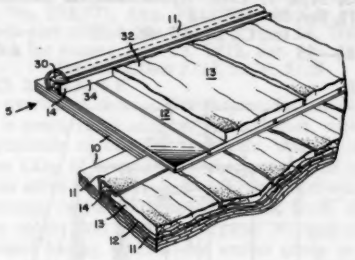
John K. Kough and Blair B. Kough, Morgan Hill, Calif., assignors to Ditz-Crane, San Francisco, Calif.

Original No. 3,509,676, dated May 5, 1970, Ser. No. 793,865, Jan. 24, 1969. Application for reissue July 15, 1970, Ser. No. 55,297

Int. Cl. E04d *1/26, 1/36*

U.S. Cl. 52—541 **9 Claims**

Disclosed is a panel a plurality of which may be used to surface the exteriors (roof and/or sides) of buildings. The panel is prefabricated and incorporates the sheathing, waterproofing, singling and shakes often found in building surfacing of high quality and is installed in abutting vertical courses each course containing as many adjacent panels as required by the roof dimensions. The panel is substantially modular so that only a small amount of on-site custom fitting is required as compared to conventional construction. In addition, the panel includes provision for inhibiting the seepage of water into the building attic even as a result of rain driven by intense wind.



27,575

WATER-INSOLUBLE BENZIMIDAZOLONE CONTAINING MONOAZO DYESTUFFS

Joachim Ribka, Offenbach am Main, and Wolfgang Pretzer, Fischbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Original No. 3,555,002, dated Jan. 12, 1971, Ser. No. 769,711, Oct. 22, 1968. Application for reissue Mar. 23, 1971, Ser. No. 127,353

Claims priority, application Germany, Aug. 2, 1968, P 17 95 052.6

Int. Cl. C09b *29/36*

U.S. Cl. 260—157 **7 Claims**

Water-insoluble monoazo-dyestuffs consisting of 5-amino-isophthalic-diamides as diazo component and 5-acetoacetylamino-benzimidazolones as coupling component and process for their preparation. Said pigments are especially suitable for dyeing and printing plastics, caoutchouc, resins of natural or synthetic origin, fibrous textile materials or paper. Moreover, the pigments can be used for the preparation of dispersion paints, lacquers and printing inks.

27,576

WATER-INSOLUBLE BENZIMIDAZOLONE CONTAINING MONOAZO DYESTUFFS

Joachim Ribka, Offenbach am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Original No. 3,555,003, dated Jan. 12, 1971, Ser. No. 769,728, Oct. 22, 1968. Application for reissue Mar. 23, 1971, Ser. No. 127,389

Claims priority, application Germany, Oct. 27, 1967, P 16 44 231.2; Aug. 2, 1968, P 17 95 051.5

Int. Cl. C09b *29/36*

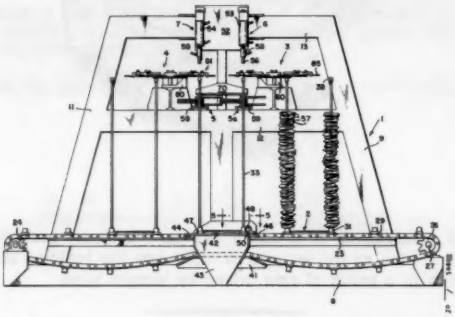
U.S. Cl. 260—157 **7 Claims**

Water-insoluble monoazo dyestuffs consisting of 5-amino-isophthalic-acid-dimethylester as diazo component and 5 - acetoacetylamino - benzimidazolones as coupling component and process for their preparation. Said pigments are especially suitable for dyeing and printing plastics, caoutchouc, resins of natural or synthetic origin, fibrous textile materials or paper. Moreover, the pigments can be used for the preparation of dispersion paints, lacquers and printing inks.

27,577
SHELL STRINGER APPARATUS

Richard F. Rawlings, 226 SW. 131st St., Seattle, Wash. 98146, and George E. Austin, Mercer Island, Wash.; said Austin assignor to said Rawlings

Original No. 3,431,803, dated Mar. 11, 1969, Ser. No. 576,635, Sept. 1, 1966. Application for reissue Feb. 12, 1971, Ser. No. 115,144
Int. Cl. B26d *7/06, 5/20*
U.S. Cl. 83—95 6 Claims

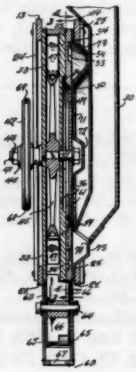


A shell stringing device for punching a hole in individual shells and stringing the shells onto a wire which is rigidly supported during the punching operation. The individual shells are automatically conveyed to the punching position over the wire, punched and strung onto the wire.

27,578
SEED PLANTER

Eugene G. Keeton, Rte. 2, Trenton, Ky. 42286

Original No. 3,308,774, dated Mar. 14, 1967, Ser. No. 550,569, May 16, 1966, which is a continuation of Ser. No. 338,927, Jan. 20, 1964. Application for reissue Jan. 29, 1968, Ser. No. 702,143
Int. Cl. A01c *9/00*
U.S. Cl. 221—219 59 Claims

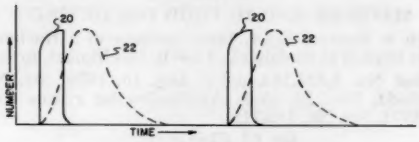


A seed planter having a seed selector which passes through a supply of seeds, engages a seed and slides it along a surface, and discharges the seed through an aperture in the surface. The surface is provided with a step which causes extra seeds engaged by the selector to drop back to the seed supply prior to discharge. A seed conveyor having removable compartment dividers can be used in conjunction with the seed selector.

27,579
METHOD OF CORE ANALYSIS USING THERMAL NEUTRON CAPTURE CROSS SECTION

Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Original No. 3,426,203, dated Feb. 4, 1969, Ser. No. 423,037, Jan. 4, 1965. Application for reissue Nov. 19. 1970, Ser. No. 91,229
Int. Cl. G01t *3/00*
U.S. Cl. 250—83.1 10 Claims

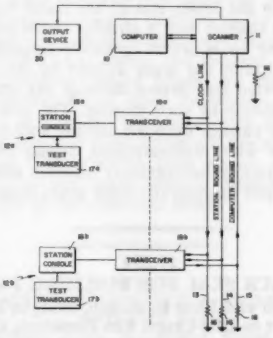


A preselected volume of a preselected standard material is irradiated at the earth's surface with a burst of fast neutrons, after which the decline of the thermal neutron population is measured. A sample of the borehole formation is then mixed with the material of the earth's surface and further readings are made of the decline of the thermal neutron population in the mixture. The first measurements are then compared with the further measurements, the comparison forming a correction factor for measurements made of the decline of the thermal neutron population with the well bore per se.

27,580
MULTIPHASIC MEDICAL SCREENING SYSTEM

Edward B. Rawson, Lincoln, Daniel B. Schwarzkopf, Stow, Joseph B. Ferguson, Harvard, and Jay H. Ball, Natick, Mass., assignors to Searle Medidata Inc.

Original No. 3,566,365, dated Feb. 23, 1971, Ser. No. 759,389, Sept. 12, 1968. Application for reissue Feb. 10, 1972, Ser. No. 225,344
Int. Cl. G06f *15/02, 15/42*
U.S. Cl. 340—172.5 16 Claims



A multiphasic medical screening system in which medical data concerning a patient is derived by suitable transducers and transmitted and processed in real time to produce a medical history and work-up of the patient. A plurality of testing stations are provided, each implemented to conduct a particular test or tests, and the stations are selectively polled by a central processor to communicate data to the stations and to receive data from the stations.

27,581

MONOFUNCTIONALLY SUBSTITUTED HYDROPHOBIC STARCH AND FILM-FORMING DISPERSIONS PREPARED THEREFROM

Erling T. Hjermstad, Cedar Rapids, Larry C. Martin, Albernett, and Kenneth W. Kirby, Cedar Rapids, Iowa, assignors to Penick & Ford, Limited, New York, N.Y.

No Drawing. Original No. 3,462,283, dated Aug. 19, 1969, Ser. No. 619,153, Feb. 28, 1967. Application for reissue Mar. 15, 1971, Ser. No. 124,560

Int. Cl. C09j *3/06;* C09d *3/20;* C09k *3/00*

U.S. Cl. 106—213 15 Claims

Hydrophobic starch dispersible in water as submicron sized particles to provide a film-forming dispersion is prepared by etherification of granule starch with a monofunctional etherifying agent providing the starch with ether-linked hydrophobic groups. The hydrophobic groups are alkyls of at least three carbons or aralkyls of at least seven carbons, and the starch is substituted to a level where it is essentially hydrophobic and does not gelatinize. The hydrophobic granule starch can be fragmented to subgranule particles of submicron size, which are dispersible in water to provide a film-forming dispersion.

27,582

METAL-CONTAINING DETERGENT-DISPERSANTS FOR LUBRICANTS

Donald J. Kahn, Metuchen, Max L. Robbins, South Orange, and Frieder S. Furer, Wayne, N.J., assignors to Esso Research and Engineering Company

No Drawing. Original No. 3,451,931, dated June 24, 1969, Ser. No. 575,971, Aug. 30, 1966, which is a continuation-in-part of Ser. No. 333,614, Dec. 26, 1963. Application for reissue June 21, 1971, Ser. No. 155,367

Int. Cl. C10m *1/32, 3/20, 5/20*

U.S. Cl. 252—32.7 E 20 Claims

An overbased detergent-dispersant for an oil composition is prepared by reacting a metal base, such as barium hydroxide or calcium hydroxide, with an acidic gas such as CO_2, H_2S, or SO_2 in the presence of an amide, imide or ester derived from a high-molecular-weight monocarboxylic or polycarboxylic acid of from 40 to 250 carbon atoms and from an organic nitrogen-containing compound having at least one amino group or hydroxy group, including alkylene polyamines, hydroxyalkyl amines and N-hydroxy alkyl morpholinones. Useful compositions are prepared by blending these reaction products into fuels and lubricants.

PLANT PATENTS

GRANTED FEBRUARY 6, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,297
PLUM TREE
Roy Sumruld, 2957 E. Tulare Ave., Tulare, Calif. 93274
Filed July 27, 1971, Ser. No. 166,648
Claims priority, application Netherlands, Aug. 25, 1970, 7012597
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—38 **1 Claim**

A plum tree which is generally similar to the unpatented Santa Rosa plum tree but which bears fruit which ripens approximately three months later than that of the Santa Rosa.

3,298
PEACH TREE
Grant Merrill, 416 N. Anderson Road, Exeter, Calif. 93221
Filed Apr. 29, 1971, Ser. No. 138,723
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and being characterized by a vigorous tree regularly bearing fruit which when mature remains firm and retains its full color on the tree, thus enabling it to be picked in one picking, having a brilliant red color over 50 to 75 percent of its skin surface upon an under color of bright yellow, and which most nearly resembles its parent plant, Franciscan (U.S. P.P. 2,239), but differs from and is an improvement on that variety by ripening about ten days later and holding its firmness longer, by its brighter yellow skin color and brighter red blush, and by being completely free from the stone when ripe.

3,299
CARNATION PLANT
William E. Duffett, Akron, Ohio, assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed June 15, 1971, Ser. No. 153,458
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation cultivar characterized particularly as to uniqueness when compared to the cultivar White Elegance by its six to ten inches more vigor; stem length which averages two inches longer; two to four more flowers and buds per stem, which enables it to grade out 5–10% higher on the top two grades; approximately 7–10 days earlier flowering on the first crop; its well budded, open sprays during the winter months; two to five days longer keeping quality; its strong but pleasant fragrance; more fully petailed flowers, averaging approximately 50% more petals per flower; and its greater stem production per square foot for one-year crops planted after July 1 and into the winter months.

3,300
CHRYSANTHEMUM PLANT
Arthur Maton, Pana, Ill., and Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Webb Greenhouses, Inc., Pana, Ill.
Filed June 23, 1971, Ser. No. 156,140
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—81 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Pink Champagne by its darker lavender flower color, approximately 20% more petals, more solid flower, flowers which reflex less at maturity, and its 2–3 days later response.

3,301
CARNATION PLANT
Ralph E. Hawes, 27 Highland Ave., Sudbury, Mass. 01776
Filed June 1, 1971, Ser. No. 149,089
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—70 **1 Claim**

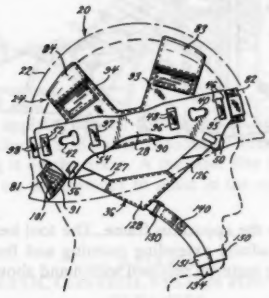
1. A new and distinct cultivar of carnation characterized particularly as to its uniqueness when compared to the cultivar White Elegance by its more fully petalled flower with a higher petal count of approximately 30 more per flower; a higher and fuller flower crown, with more symmetrically placed petals; flowers which never develop hollow centers; a more compact spray formation which becomes less terminal in winter under low light conditions; stronger, shorter pedicels supporting flowers; higher but count, averaging 1–2 more flowers and buds per stem; more ivory flower coloration; one to two days longer keeping quality under identical conditions; breaks on return crops clear lateral growth more rapidly and come into flower sooner under late winter and early spring conditions, thereby providing higher annual production per square foot per year on late season plantings.

PATENTS

GRANTED FEBRUARY 6, 1973

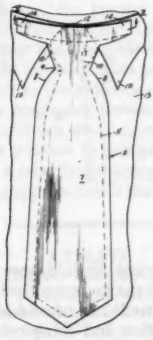
GENERAL AND MECHANICAL

3,714,668
PROTECTIVE HELMET
Anthony C. Mirabella, Hartford, Conn., assignor to Angelica Corporation, St. Louis, Mo.
Filed Feb. 11, 1971, Ser. No. 114,538
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 C **18 Claims**



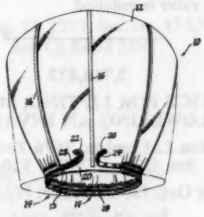
This invention relates to a new and improved helmet comprising an outer shell and an advanced helmet suspension system supported therein. Also provided are adjusting means for fitting the suspension system to the exact head size required, including separate adjustments for the forehead, nape, and top of the head as well as for correctly positioning the suspension system within the shell.

3,714,669
FOUR-IN-HAND TIE SHIELD
Roger C. Vorbau, 417 Dawn, Glen Ellyn, Ill. 60137
Filed Feb. 4, 1971, Ser. No. 112,578
Int. Cl. A41d *27/12*
U.S. Cl. 2—46 **11 Claims**



A one-piece panel in a form simulative of and preferably a little wider than the current widest style of four-in-hand ties provides a pendant shield having on its upper end attachment means in the form of lateral wing-like tabs carrying pressure-sensitive adhesive on the back whereby the device can be attached to the adjacent wing portions of the wearer's collar or to the knot of the tie with the shield protectively overlying the tie.

3,714,670
HAND SHAPABLE CAP WITH ADJUSTABLE HEADBAND
Shirley Pollack, 1830 Balmoral, Detroit, Mich., and Devora Finsilver, 7344 Deep Run Drive, Birmingham, Mich.
Filed Dec. 22, 1970, Ser. No. 100,746
Int. Cl. A42b *1/02*
U.S. Cl. 2—197 **1 Claim**

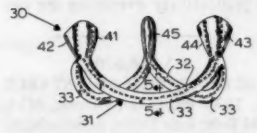


A hand shapable cap including a large bulbous body of flexible material for enclosing the hair of the wearer with a headband portion at the rim of the bulbous body for supporting the body on the head of the wearer, and a plurality of nonresilient, hand formable stiffening elements secured to the flexible material of the body permitting the body to be hand formed into a desired free shape according to the coiffure of the wearer so that the body can enclose the hair but at the same time remain substantially out of contact therewith when the cap is supported on the head of the wearer, the headband portion having elastic and nonelastic segments permitting the headband to be extended to its maximum circumference so as not to disturb the coiffure as the cap is placed on the head of the wearer, and adjustable means on the headband for selectively adjusting the length of the nonelastic segment and hence the tension of the elastic segment to secure the headband to the head of the wearer.

3,714,671
TISSUE-TYPE HEART VALVE WITH A GRAFT SUPPORT RING OR STENT
William Sterling Edwards, Albuquerque, N. Mex.; Paul Kahn, San Francisco, Calif., and Samuel H. Goodenough, Oakland, Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.
Filed Nov. 30, 1970, Ser. No. 93,545
Int. Cl. A61f *1/22*
U.S. Cl. 3—1 **21 Claims**

A tricuspid valve and a graft support ring or stent therefor. The frame of the stent comprises three wire arcs, each formed along a circular or elliptical cylindrical surface. Each arc has an upstanding end portion that blends into a line parallel to the axis of the cylinder. Preferably, each arc is a separate wire, and, an elastomeric coating or a cloth pledget may lie over the meeting ends, which may be welded together. A fabric cover-

ing completely surrounds and encloses the frame, the coating or pledget preventing later strike-through of the fabric by the metal during use. The fabric covering preferably provides a pair of radial wings at each post, one extending inwardly and the other one outwardly, and it also provides a continuous projection along the length of the wires for stitching. To this graft support ring is sutured living tissue, preferably au-



tologous or homologous, by stitches to the wings and the continuous projection. A plurality of such tissue members, e.g., fascia lata, is used, one for each wire arc, shaped to provide a cusp-type valve. The tissue covers essentially all the surfaces of the fabric on both the inner and outer. faces, so that essentially nothing but tissue is in contact with the blood and body tissues after the valve is installed.

3,714,672

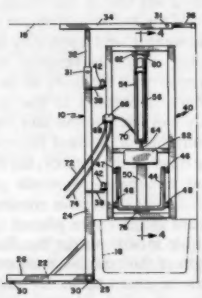
SEAT DEVICE FOR LIFTING, MOVING AND LOWERING AN INVALID

Gordon L. Condon, 7676 Torrem St., San Diego, Calif. 92041

Filed Oct. 12, 1970, Ser. No. 79,998

Int. Cl. A47k *3/12*

U.S. Cl. 4—185 L **5 Claims**



A device having a seat for supporting an invalid, which seat is supported on a movable frame and which frame raises and lowers the seat, whereby an invalid can position himself on the seat and then be moved over a bathtub and be lowered into the bathtub, and then be raised again and be moved back to his original position.

3,714,673

RETORT BUMPING MACHINE

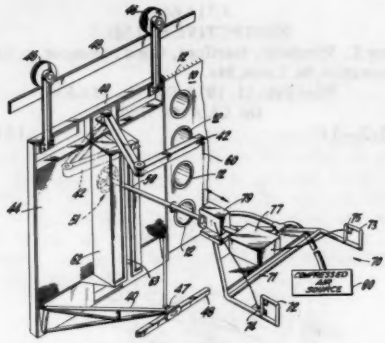
Laddie L. Brown, Blackwell, Okla., assignor to American Metal Climax, Inc., New York, N.Y.

Filed May 3, 1971, Ser. No. 139,383

Int. Cl. B08b *9/02*

U.S. Cl. 15—104.1 R **9 Claims**

Apparatus for dislodging (herein: "bumping") loam, zinc oxide and the like from a horizontal retort furnace employs a main frame mounted for horizontal translation about the retort orifice plane. A cleaning tool head portion is disposed on a rotating shaft which projects through a vertical slot in a heat



shield secured to the apparatus frame. The tool head portion includes plural radially extending reaming and facing members for removing material retained within and about the front retort areas.

3,714,674

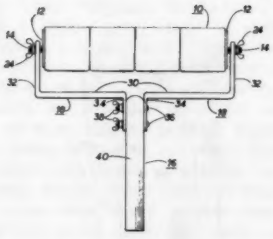
ROLLER PAINT APPLICATOR

Otello M. Simoncioni, 6527 Wuerpel St., New Orleans, La. 70124

Filed May 12, 1971, Ser. No. 142,660

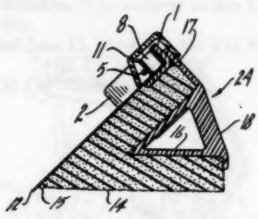
Int. Cl. B44d *3/28*

U.S. Cl. 15—230.11 **1 Claim**



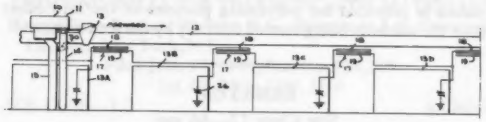
A length of cylindrical flexible hose adapted to rotate longitudinally around shafts respectively mounted in line in the oppositely disposed ends of said hose, said shafts defining an axis of rotation and being rotatably engaged by respective flexible arms of a bifurcated handle. A roller cover, comprising a plurality of cylindrical sections which are adapted to snugly fit over said roller, extends sequentially between said oppositely disposed ends. The combination of said flexible roller, sectioned roller cover and flexible arms allow the paint applicator to conform to the shapes of angular and curved surfaces for roller painting thereof, as well as for flat surfaces.

3,714,675
LINE DRAWING PAINT APPLICATOR
Leonid Koptelow, 619 County Trunk S, Oconomowoc, Wis.
Continuation-in-part of Ser. No. 124,212, March 15, 1971, abandoned. This application July 16, 1971, Ser. No. 163,402
Int. Cl. A46b *17/00*; B44d *3/22*
U.S. Cl. 15—244 CH **8 Claims**



A paint applying device for edging or lining areas to be painted includes a member capable of receiving paint and discharging it on the areas. A movable line drawing blade is positioned on the member to assist in the application of the paint.

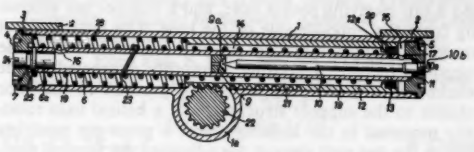
3,714,676
AUTOMATIC CONTROL SYSTEM FOR TRAVELING CLEANERS
Donald A. Sloan, Winston Salem, N.C., assignor to The Bahnson Company, Winston Salem, N.C.
Filed Oct. 14, 1971, Ser. No. 189,437
Int. Cl. A47l *5/38*
U.S. Cl. 15—312 R **10 Claims**



A control system for a traveling cleaner which travels in first and second directions on an overhead track centered above a row of textile machines, the control system comprising a switch for each textile machine for signifying when it is shut down, and a conductor bar assembly on the overhead track structure at a location between each pair of textile machines electrically connected to the switches of the textile machines located adjacent the conductor bar assembly in the first and second directions therefrom, and a contact arm carried by the traveling cleaner in a position to engage the conductor bar assemblies to activate a relay for stopping the cleaner when the textile machine being approached is shut down.

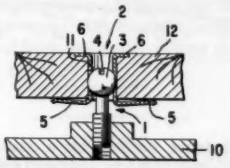
3,714,677
DOOR CLOSING MECHANISM WITH FLUID BRAKE
Jakob Schmid, Bernstrasse 1647, Aargau, Switzerland
Filed Feb. 24, 1971, Ser. No. 118,296
Claims priority, application Switzerland, Apr. 29, 1970, 6,441/70
Int. Cl. E05f *3/04, 3/14*
U.S. Cl. 16—62 **8 Claims**

There is disclosed a door closing mechanism of the type incorporating a fluid brake, and utilizing a piston member which is displaceable by means of at least one helical spring, a rotatable rod being located within such helical spring. Separate adjustment means are provided for the purpose of enabling the helical spring to be adjustably positioned along the rod. According to an important aspect of the invention the adjustment means



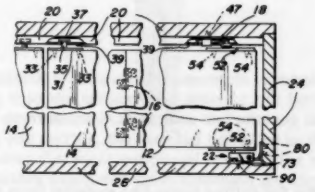
comprises at least one support means, for instance in the form of a support pin, for the spring, this support pin extending between the windings of the helical spring.

3,714,678
BALL HINGES
William Weisz, Rockaway, and William L. Herron, No. Caldwell, both of N.J., assignors to The Singer Company, New York, N.Y.
Filed Aug. 23, 1971, Ser. No. 173,765
Int. Cl. E05d *1/06*
U.S. Cl. 16—128 R **3 Claims**



A ball hinge device characterized by its economical construction in that a ball head screw is used in conjunction with a bracket which may be formed of sheet metal or of non-metallic resilient material which depends for its strength and support on the close fit between it and a slot machined into a supporting panel. A construction is taught in which the hinge may be attached to the supporting panel without the use of additional hardware.

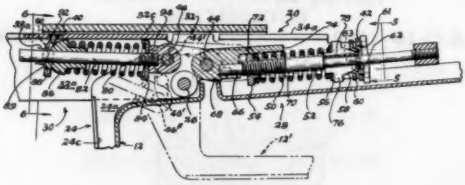
3,714,679
BIFOLD DOOR HARDWARE
James A. Edeus, Rock Falls, Ill., assignor to National Manufacturing Co., Sterling, Ill.
Original application Mar. 2, 1970, Ser. No. 15,360. Divided and this application July 12, 1971, Ser. No. 161,973
Int. Cl. E05d *7/04*
U.S. Cl. 16—131 **8 Claims**



Bifold door hardware includes a socket member mounted on an overhead support structure for receiving an upstanding pivot pin on the top edge of the door, and

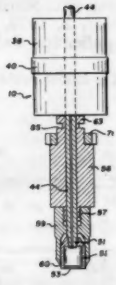
a jamb bracket assembly mounted below the bottom edge of the door for receiving and supporting a depending pivot pin on the bottom edge of the door. The socket member includes a mounting base, a resilient clip extending from one side of the base and having in its distal end a pin-receiving socket hole, and a bumper tab extending from the opposite side of the base. The jamb bracket assembly includes a bracket adapted to be fastened to the support structure, a housing adjustably connected to the bracket for adjusting the horizontal position of the door relative to the support structure, and a helical cam rotatably mounted in the housing below a pivot-pin receiving hole in the top wall thereof for adjusting the vertical position of the door.

3,714,680
COUNTER-BALANCE SUPPORT
Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Nov. 17, 1971, Ser. No. 199,584
Int. Cl. E05f *1/12*
U.S. Cl. 16—190 **7 Claims**



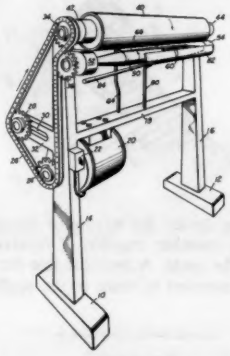
A counter-balance support for a suspended lid including a pair of compression springs acting alternatively together and in opposition for effectively counter-balancing the weight of the lid during vertical swinging movement thereof.

3,714,681
CUTTING APPARATUS FOR TISSUE-LIKE MATERIAL
Anton P. M. Van Snellenberg, Vancouver, British Columbia, Canada, assignor to The Canadian Fishing Company Limited, Vancouver, British Columbia, Canada
Filed Aug. 10, 1970, Ser. No. 62,492
Int. Cl. A22c *25/00*
U.S. Cl. 17—1 R **16 Claims**



Apparatus for cutting tissue-like material from a soft or unsupported background material, such as cutting glands out of membranes in heads of fish. The tissue is drawn against a suction head, and a cutter sleeve surrounding the head cuts the background material around said tissue. The removed tissue is blown from the suction head.

3,714,682
METHOD AND APPARATUS FOR REMOVING OIL GLANDS FROM FOWL
Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.
Filed Feb. 16, 1971, Ser. No. 115,318
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **9 Claims**

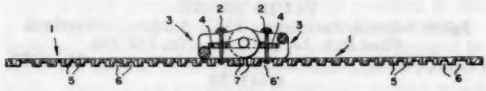


A bird is moved along a path and feed means including a pair of counterrotating rollers grips the opposite sides of the tail of the bird and moves the tail laterally of said path into engagement with the cutting edge of a fixed cutting means extending between said rollers. One of the rollers slopes upwardly toward the cutting means so as to pinch the oil gland of the bird between the cutting edge of the cutting means and said upwardly sloping member to cut off the oil Gland. Guide means is provided for preventing portions of the bird other than the tail from being carried laterally by the feed means.

ERRATUM

For Class 17—66 see:
Patent No. 3,715,229

3,714,683
SLIDE-FASTENER STRINGER WITH STITCHED-ON COUPLING ELEMENT
Alfons Frohlich; Marie-Luise Cappel, both of Essen, and Ernst Strubiger, Giessen, all of Germany, assignors to Opti-Holding AG, Glarus/Schweiz, Germany
Filed Oct. 20, 1970, Ser. No. 82,324
Claims priority, application Germany, April 4, 1972, P 20 16 146.0
Int. Cl. A44b *19/40*
U.S. Cl. 24—205.1 C **4 Claims**



A slide-fastener stringer has a pair of warp-knit support tapes with longitudinally running wales separated by valleys. A coupling element is stitched to each tape adjacent the edge thereof with rows of stitching passing through the tape only in

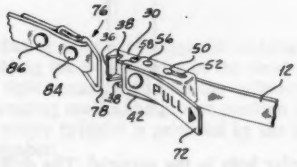
the valley adjacent one of the edge wales thereof. In the case of a very fine knit, the stitching lies in the second valley in from the tape edge. The edge wale is reinforced for best holding action by knitting it with a relatively dense or bulky yarn.

3,714,684

SKI SAFETY STRAP LATCH

Paul R. Gley, Hillsdale, N.J., assignor to Rex Chainbelt, Inc., Milwaukee, Wis.

Filed June 12, 1969, Ser. No. 832,784
Int. Cl. A47b *19/00*
U.S. Cl. 24—230 AM 3 Claims



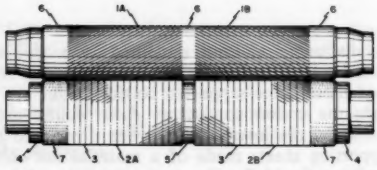
A latch for a ski safety strap in which a base formed with a hook and secured to one end of the safety strap slidably supports a cover for movement between a first position at which it closes the hook to retain a ring carried by the other end of the strap within the hook and a second position at which the hook is open to permit the ring to fall away from the hook. A spring housed by the cover and base biases the cover to its hook closing position.

3,714,685

CRIMPING ROLLS FOR THERMOPLASTIC MATERIALS

Harold Dean Yarber, Wallace, N.C., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed June 17, 1971, Ser. No. 154,109
Int. Cl. D02g *1/00, 1/14*
U.S. Cl. 28—1.2 6 Claims



Crimping rolls for crimping thermoplastic textile material are provided with inclined engravings on the customary heated roll, with the engravings inclined in one direction on part of the roll and the opposite direction on the other, forming inverted or upright V's. The embossed roll, which is embossed by running against the engraved roll, similarly has its embossing inclined in more than one direction. Preferably, the embossed roll may be provided with a central rigid spacer or several if the rolls are divided into four instead of two parts. The inclined engravings and mating embossings do not cause the surface of the embossed roll, which is usually a non-woven hard felt surface, to creep in a single direction, and wear is reduced and frequency of having to true-up the embossed roll is greatly reduced.

3,714,686

PROCESS AND APPARATUS FOR TEXTURING FILAMENTS

Hans Schmid, Ludwigshafen, Heinrich Feldhoff, Bad Durkheim, Wolfgang Martin, Ludwigshafen, Wolfgang Bauer, Heidelberg, and Dieter Herion, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 8, 1971, Ser. No. 113,502
Claims priority, application Germany, Feb. 11, 1970, P 20 06 022.4
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 8 Claims

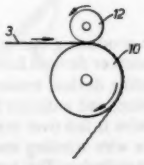
Process and apparatus for texturing filaments by subjecting the filaments to a flowing heated gaseous medium. The filaments are exposed to a turbulently flowing medium in two zones, an exchange between the medium and the ambient air taking place in the second zone. By means of this process and apparatus filaments made of synthetic linear materials of high molecular weight may be textured at high filament speeds.

3,714,687

METHOD OF BIAXIALLY DEFORMING SHEET MATERIAL

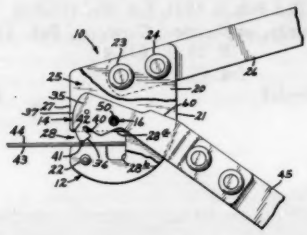
Jan van Tilburg, Alkmaar, Netherlands, assignor to American Can Company, Greenwich, Conn.

Filed Feb. 3, 1970, Ser. No. 8,342
Claims priority, application Great Britain, Feb. 17, 1969, 8,473/68; Feb. 11, 1969, 72,902/69; March 27, 1969, 16,181/69
Int. Cl. D02g *1/00, 1/14*
U.S. Cl. 28—72.1 16 Claims



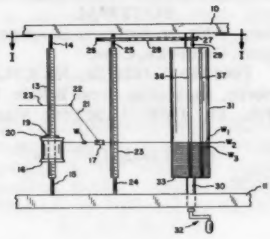
Sheet material is deformed, for example crimped or bulked by feeding it to the surface of a rotating roll having a multiplicity of depressions in its surface and pressing the material against the roll surface, the material being fed to the roll at a rate exceeding the linear peripheral speed of the roll. Examples of materials which may be so deformed are filaments consisting of or containing thermoplastic polymers, woven and non-woven fabrics, thermoplastic sheets, paper and metal foils. Preferably, the roll surface consists of sintered particulate material, the depressions being the voids between adjacent particles.

3,714,688
PUNCH RIVETER FOR JOINING METALS
Glenn V. Olson, 2654 Keeler Pkwy., St. Paul, Minn.
Filed June 11, 1971, Ser. No. 152,043
Int. Cl. B23p *17/00*
U.S. Cl. 29—21.1 **6 Claims**



A punch riveter for joining metal studs and runners by piercing the overlying metals and then folding back and crimping the pierced metal. The opening punched in each of the metals is of a generally rectangular shape and the pierced metal is rolled back along the uncut edge thereof.

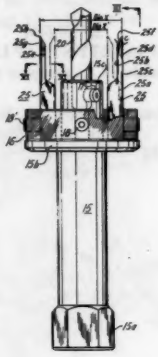
3,714,689
APPARATUS FOR MAKING SPARK CHAMBER WIRE ARRAYS
Albert Whetstone, Southport, Conn.; Samuel Fine, New City, N.Y., and Stanley Phillips, Trumbull, Conn., assignors to Science Accessories Corporation, Southport, Conn.
Filed Dec. 14, 1970, Ser. No. 97,581
Int. Cl. H01j *9/06, 9/48*
U.S. Cl. 29—25.2 **1 Claim**



An apparatus for producing curved or flat wire arrays for use in wire spark chamber devices having a wire spool holding means and wire feeding device; tensioning means; wire winding and spacing device; and a device for stretching and shaping the array. The wire is fed over tensioning pulleys about a threaded rod onto a wire winding and spacing device which comprises a support cylinder. The wound wires are attached to lucite strips mounted on the cylinder and then cut and removed to form a loose wire array. The wire array is then clamped in the stretching and shaping device which stretches the wires and forms the surface to the desired curvature.

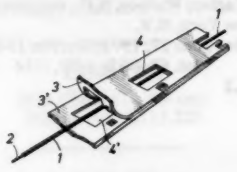
3,714,690
BELT HOLE CUTTER
Joseph A. Parenti, Rte. 7, P.O. Box 330, Morgantown, W. Va. 26505
Original application Sept. 17, 1968, Ser. No. 760,176, now Patent No. 3,504,577. Divided and this application Sept. 30, 1969, Ser. No. 862,360
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 A **5 Claims**

A rotative hole cutting device for a heavy, somewhat soft, resilient, fabric-like material in the nature of belting is provided with a forwardly-extending drill stem that first enters the material, and with a pair of opposed, especially-constructed and positioned key-like cutter elements that follow the drill stem and quickly and efficiently cut-



out a circular hole in the material. The drill stem serves to guide movement of the cutter elements and to retain the part or fragment being cut-out in position until the completion of the operation.

3,714,691
METHOD FOR PRODUCING SHEET SUPPORTED COILED CONDUCTORS
Masanobu Aizawa, Tokyo, and Kijuu Mori, Kawasaki-shi, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1970, Ser. No. 90,602
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.15 **5 Claims**

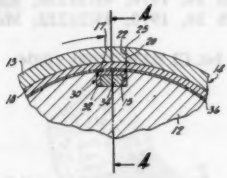


This disclosure relates to a method for producing sheet supported coiled conductors and also to various constructions of these sheet supported coiled conductors. In the method, the coiled conductors each wound around a core material are interposed between a required number of supporting sheets made of a material not soluble in a dissolving liquid for the core material and having a plurality of cutout portions therethrough so that a substantial part of the coiled conductors is exposed through the cutout portions, and the whole of the coiled conductors interposed between the supporting sheets is immersed into the dissolving liquid for the core material so that the core material is thereby dissolved and removed from the coiled conductors.

3,714,692
COATING MAT
Andrew M. Bray, Little Suamico, Wis., assignor to Magna-Graphics Corp., Dayton, Ohio
Filed June 28, 1971, Ser. No. 157,182
Int. Cl. B21b *31/08*
U.S. Cl. 29—129 **13 Claims**

A coating mat formed from a sheet of resilient material which is adapted to be wrapped around the outer surface

of a rotary cylinder. The coating mat includes a magnetic backing or a magnetic member for securing the mat to the cylinder. The magnetic member is secured to at least the leading edge of said mat and is adapted to be positioned in a slot provided in the rotary cylinder. The magnetic



member including a strip of magnetic material for magnetically holding the leading edge of the sheet of resilient material in tight engagement with the cylinder. Registration of the coating mat in the proper position on the surface of the rotary cylinder is provided by the slot for the magnetic member.

3,714,693

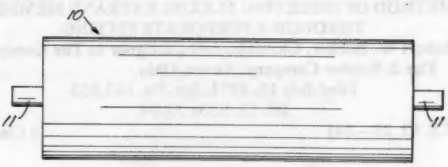
INKING COVER

Stanley G. Peterson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 30, 1971, Ser. No. 185,127

Int. Cl. B21b *31/08*

U.S. Cl. 29—132 **7 Claims**



An inking cover which has at least a working surface comprised of filled crosslinked poly(epichlorohydrin/ethylene oxide) elastomer plasticized with monomeric ester plasticizer, e.g., tricresyl phosphate, to provide a hardness value of from about 40 to 50 Shore A durometer, contains an amount of microcrystalline wax sufficient to substantially prevent exudation of the plasticizer.

3,714,694

PROCESS OF MAKING A COMPOSITE BEARING RACE OR THE LIKE

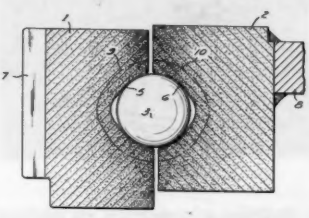
John C. Dobson, Bay Village, Ohio, assignor to Formmet Corporation, Avon, Ohio

Filed June 9, 1971, Ser. No. 151,264

Int. Cl. B21h *1/12;* **B23p** *25/00*

U.S. Cl. 29—148.4 R **14 Claims**

Disclosed are antifriction bearings, annular ring blanks for forming races of the bearings, and a process of making the annular blanks. The process involves centrifugally casting metals having different chemical compositions, such as steel having different amounts of carbon or other alloying elements, to form a tubular casting having at one periphery metal that has a different chemical or metallurgical composition and hardenability than the metal at the other periphery; annular rings are cut from this tubular casting, and these rings are hot worked by working including roll forging, under conditions that beneficially modify the structure of the metal. The resulting race may be machined into annular bearing races by the usual procedures to form bearing races. These races are hardened in a known manner and by known means, to provide hard metal



where the rolling antifriction elements, such as balls, contact the metal, while the metal at the opposite side of the race is substantially more ductile and tough, so that it may be machined to provide gear teeth, or may be machined or welded for other purposes as to provide fastening means for the bearing race.

3,714,695

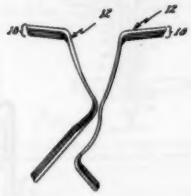
METHOD FOR FORMING THRUST CHAMBERS

Phillip Beeson, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 17, 1970, Ser. No. 56,166

Int. Cl. B21d *53/00*

U.S. Cl. 29—157 C **3 Claims**



A method for forming thrust chambers in which a plurality of tubes are welded together in tube-to-tube alignment. These tubes form a "blanket" of tubes which can then be formed to any desired thrust chamber configuration.

3,714,696

BUILDING CONSTRUCTION ASSEMBLING AND POSITIONING APPARATUS

Charles Kay, 7056 Thornapple River Drive, S.E., Caledonia, Mich.

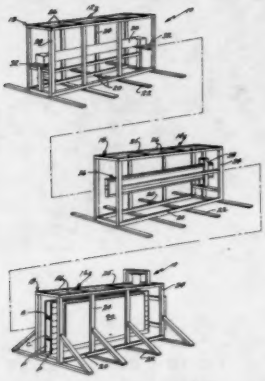
Filed March 18, 1971, Ser. No. 125,707

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 P **10 Claims**

Apparatus for making structural building units from a pair of spaced panels and interconnecting elongated plates, employing plate insertion means cammed into plate gripping condition during powered advancement thereof between panel re-

tention means for insertion of the plates into the panels. The plate insertion means has elongated clamp elements forced together on the plates.



The leading end of the plate insertion means preferably has broach means to cut slots into the panels ahead of the advancing plates.

3,714,697

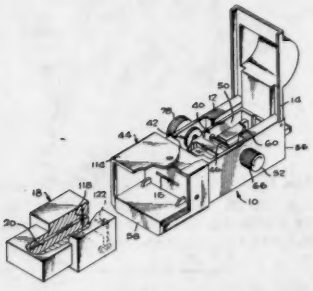
FILM CHIP STRIPPER

Gunter Schmidt, Malibu, Calif., assignor to Production, Inc., Los Angeles, Calif.

Division of Ser. No. 732,186, May 27, 1968, Pat. No. 3,559,554. This application Oct. 12, 1970, Ser. No. 80,083

Int. Cl. G03d *13/08, 17/00*

U.S. Cl. 29—239 3 Claims



Apparatus which can be used in a lighted room to strip the coverings from a film chip which is held in a protective package and insert the chip into a light-tight magazine. The stripping apparatus includes a hub that engages a tab on the film chip package to peel off an outer layer, and an assembly that holds another protective layer of the package away from the film chip while a roller moves the chip toward a slot that leads to the magazine.

3,714,698

METHOD AND MACHINE FOR ASSEMBLING SLIDE FASTENERS OF SEPARABLE TYPE

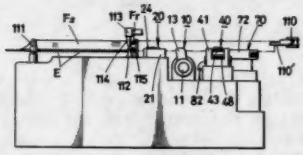
Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed March 2, 1971, Ser. No. 120,278

Claims priority, application Japan, March 14, 1970, 45/21219; March 14, 1970, 45/21220; March 14, 1970, 45/21221; March 14, 1970, 45/21222; March 14, 1970, 45/21223

Int. Cl. B23p *11/00, 19/04*

U.S. Cl. 29—408 17 Claims



A method and apparatus for assembling separable type slide fasteners whereby two separated fastener stringers are advanced by grippers along parallel paths and during such advancement, both stringers are cut by scissor devices, one stringer is threaded through a slider presented by a movable holder and receives a box and pin component applied by a clamping means, and the other stringer receives a pin component applied by a preclamping device and then secured and punched to finished form by another clamping device.

3,714,699

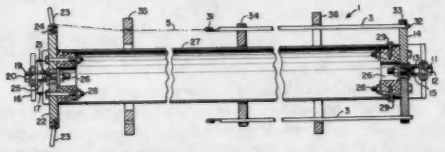
METHOD OF INSERTING FLEXIBLE STRAND MEMBERS THROUGH A PERFORATE FITTING

Robert W. Bucher, Glendale, Ariz., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 19, 1971, Ser. No. 163,853

Int. Cl. B23p *19/04*

U.S. Cl. 29—241 8 Claims



A method and apparatus for inserting flexible cords or strands through holes in a perforate fitting for a high strength container such as a crash resistant fuel tank. A fixture is attached to one end of a plurality of elongated rods to support them parallel to each other in a position to match the hole pattern of the fitting to permit a plurality of the fittings to be slid onto the free end of the rods with each hole of each fitting having one of the rods passing therethrough. A plurality of cords or strands are looped around a hook on the free end of each rod and are fastened to a remote retaining member to position the strands in substantially axial alignment with the rods and provide an elongated extension of the rods so that each fitting may be slid from the rods onto the strands. The fittings are then spaced apart from each other on the strands and the strands are cut midway between each fitting leaving a group of strands through each hole of each fitting for attaching the fitting to a container wall.

3,714,700
APPARATUS FOR ORIENTING SLENDER PARTICLES

Hubert Ehrenfellner, Surrey, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

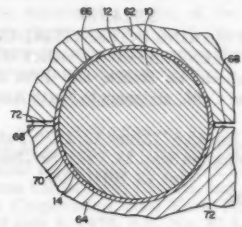
Filed Mar. 12, 1971, Ser. No. 123,545
Int. Cl. B23p *17/00*
U.S. Cl. 29—419 10 Claims

A method of and apparatus for orienting slender particles such as cellulosic splinters or flakes used in the manufacture of panels, cores for plywood panels and other boards, and in which the slender particles are oriented by a curved chute which directs them onto a mat of the particles.

3,714,701
MANUFACTURE OF CLAD METALS

Paul A. Dion, and Paul O. Hagarman, both of North Attleboro, Mass., assignors to Polymetallurgical, Corp., Attleboro, Mass.

Filed Jan. 4, 1971, Ser. No. 103,518
Int. Cl. B21d *39/04*
U.S. Cl. 29—474.1 13 Claims



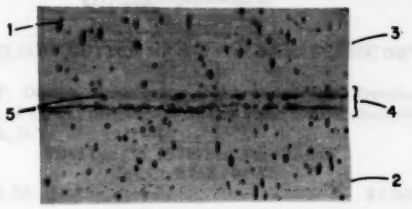
A continuous process for cladding a metal core rod with a dissimilar metal sheath. Two thin, flat strips are pre-bent into facing semi-circular shapes and then are moved into convergence around a round core rod while the strips and rod are maintained contaminant free. The strips and rod are maintained at a substantially equal temperature and the assembly is solid-phase roll bonded to produce a clad rod suitable for subsequent drawing into wire without the need for subsequent sintering, metal removal or other finishing operations on the clad rod.

3,714,702
METHOD FOR DIFFUSION BONDING REFRACTORY METALS AND ALLOYS

Joseph P. Hammond, Knoxville, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 17, 1971, Ser. No. 172,533
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 29—494 7 Claims

An improvement in the method of diffusion-bonding articles comprised of refractory metals or alloy combinations thereof. The customary intermediate placed between the articles to promote bonding is modified by incorporating therein a dispersion of fine particles which at the bonding temperature are chemically and physically stable and substantially non-reactive and non-coherent with the intermediate. The

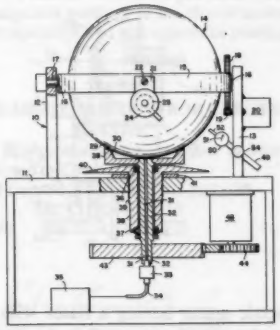


dispersed particles are selected to be essentially mutually insoluble with the intermediate. The high-energy boundaries provided by the dispersed particles act as inexhaustible sinks for lattice vacancies in the matrix metal or alloy, thus suppressing the formation of Kirkendall voids in the interlayer between the articles.

3,714,703
BOWLING BALL REFINISHING MACHINE

Travis N. Maples, 1326 E. Country Club Road, Roswell, N. Mex.

Filed May 27, 1970, Ser. No. 40,855
Int. Cl. B24b *11/02*
U.S. Cl. 29—560 8 Claims



A machine for restoring the sphericity of used bowling balls in which a bowling ball is held in a vacuum chuck and rotated about a vertical axis passing through the center of the ball. A cutter is moved through an arcuate path in a vertical plane which includes the vertical axis of rotation, the cutter being moved in a circular path about a horizontal axis through the center of the ball. After the major upper portion of the ball has been cut, the ball is removed from the chuck, inverted and reseated in the chuck. The chuck is elevated and the remainder of the surface of the ball is cut as before.

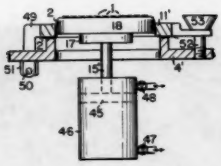
3,714,704
WAFER SPREADER

Arthur H. Moore, Campbell, Calif., assignor to Hugle Industries, Inc., Sunnyvale, Calif.

Filed Aug. 31, 1970, Ser. No. 68,287
Int. Cl. B01j *17/00*
U.S. Cl. 29—569 8 Claims

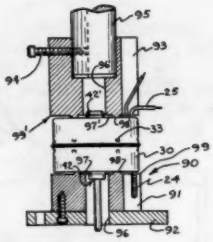
A method for separating pieces (dies) of a semiconductor wafer in which the wafer is attached to a vinyl

film, scribed, broken, and the film stretched in all radial dimensions. A plunger-type device having a rounded chamfer in contact with the film and a Teflon or nylon



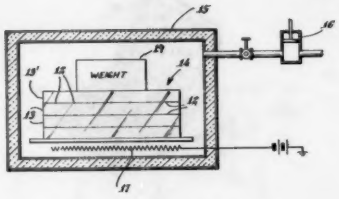
surface is used to stretch the film radially by deforming it axially. The film is heated for attaching the wafer and for the stretching process. A vacuum step may be employed to enhance wafer-film adherence.

3,714,705
METHOD OF ASSEMBLING A DYNAMO-ELECTRIC MACHINE
John G. Lewis, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Sept. 9, 1971, Ser. No. 178,953
Int. Cl. H02k *15/00, 15/14, 15/16*
U.S. Cl. 29—596 **17 Claims**



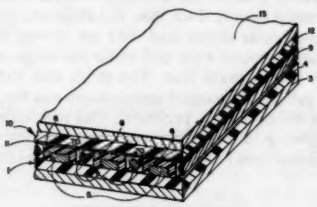
An electric motor having a stator with a central bore, a rotor part rotatably mounted in the bore, formed sheet metal end shields secured to the stator, and bearing assemblies press fitted in the end shields for rotatably supporting the rotor shaft. Each end shield includes a central seat for supporting the bearing assembly. In one embodiment, the seat includes an axially inwardly extending cup integral with a formed sheet material end shield, and in another embodiment the seat is merely a lip defining a hole in the end shield, and a separate cup forms a part of the bearing assembly. The bearing assembly includes a spring supported by the cup for biasing the bearing against a seating surface in the bearing assembly. The motor is assembled by coating the stator with a varnish, allowing the varnish to air dry to a semi-cure state, placing the end shield on the stator in contact with the varnish, with the bearing in contact with a spacer on the rotor shaft, curing the varnish, deflecting a portion of the end shield around the seat inwardly, thereby shifting the bearing with respect to the seat, and releasing the end shield with the bearing maintained in its shifted position, thereby establishing a desired end play for the rotor.

3,714,706
ARRAY OF CONDUCTORS FIXED THROUGH DIELECTRIC PLATE
Fremont Reizman, Wilton, and Robert B. McGraw, Jr., Orange, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Aug. 21, 1970, Ser. No. 65,768
Int. Cl. H01b *13/00;* **H05k** *3/00*
U.S. Cl. 29—624 **1 Claim**



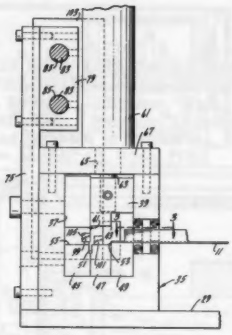
Arrays of conductors accurately fixed in position relative to each other are made by laying stripes of conductive material, such as thin stripes of chromium, gold or platinum group metals, on a surface of each of a number of plates of dielectric material, such as glass, that softens when heated and that fuses to similar material at the softening point. The plates are stacked, placed under compression normal to their conductor bearing surfaces in a partial vacuum and heated to the softening point. The vacuum is then relieved and the heat turned off. After the stack cools below the softening point, the fused stack is sliced at an angle to the lengths of the conductors to provide plates having conductor arrays therethrough.

3,714,707
METHOD OF MAKING INTERSTITIAL CONDUCTORS BETWEEN PLATED MEMORY WIRES
Joseph M. Shaheen, La Habra, and John Simone, Garden Grove, both of Calif., assignors to North American Rockwell Corporation
Division of Ser. No. 45,677, June 12, 1970, Pat. No. 3,641,520. This application Sept. 23, 1971, Ser. No. 182,973
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **6 Claims**



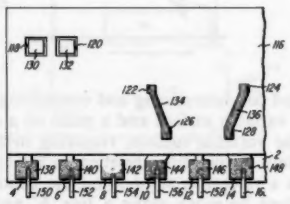
A copper layer on a dielectric substrate is etched into strips for forming interstitial conductors. Layers of resinous material are placed over the strips for forming channels therebetween. The exposed surface of a dielectric layer clad on one side by a metal layer is placed over the channels to form tunnels for plated memory wires. The outer metal layers of the structure are etched to form word straps orthogonal to the tunnels. The interstitial conductors between the tunnels are interconnected at a common point.

3,714,708
WIRE TERMINAL MAKING AND ASSEMBLING
Maurice H. Brown, 12521 S. 68th Court, Palos Heights, Ill.
Filed Jan. 20, 1971, Ser. No. 108,065
Int. Cl. H01b *13/00*; H05k *3/00*
U.S. Cl. 29—624 6 Claims



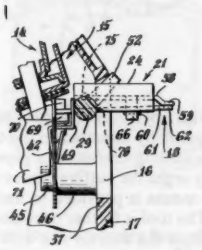
A method of forming a wire terminal and attaching it to a thermoplastic support member for a coil form. The terminal is formed from a continuous piece of wire by bending one end of the wire into a modified U-shaped configuration having one leg of the U-bent intermediate its length to extend at right angles to the other leg and severing the wire configuration from the continuous piece of wire. The wire configuration or terminal is then transported in supporting contact with a pair of electrodes to a position adjacent a thermoplastic support member. The terminal is heated by means of electrical current passed through the electrodes. While hot, the terminal and the thermoplastic support member are brought into engagement with each other to embed the bight portion of the terminal in the thermoplastic material by fusion of the thermoplastic material due to the heat of the terminal. The electrodes are then removed from the terminal leaving the terminal embedded in the thermoplastic support member.

3,714,709
METHOD OF MANUFACTURING THICK-FILM HYBRID INTEGRATED CIRCUITS
William Herman Liederbach, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.
Filed July 6, 1970, Ser. No. 52,538
Int. Cl. B41m *3/08*; H05k *3/00*
U.S. Cl. 29—626 6 Claims



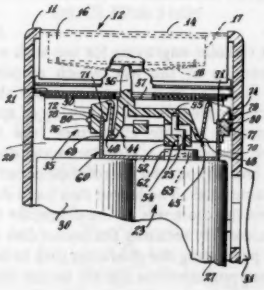
Method comprises: (1) screen printing on a ceramic substrate a pattern of conductors, resistors and sometimes capacitors and inductors; (2) firing to cure these components; (3) covering the fired components and substrate with a thin layer of a resin composition which is relatively pure, soft, elastic, and non-brittle, leaving openings in the layer where discrete active components are to be mounted and where jumper connections are to be made; (4) mounting the active components within some of these openings and making screen-printed jumper connections between other openings; and (5) encapsulating in an outer layer of a tough, good thermal conducting, moisture resistant, tightly adherent type resin composition.

3,714,710
AUXILIARY CUTTER MEANS FOR AN ELECTRIC DRY SHAVER
John F. Daniels, Bridgeport, and Antonio Pires, Trumbull, both of Conn., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 30, 1970, Ser. No. 102,846
Int. Cl. B26b *19/38*
U.S. Cl. 30—34.1 8 Claims



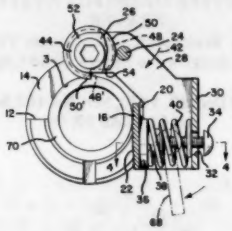
An auxiliary trimmer unit for an electric dry shaver comprising a stationary cutter and a movable cutter carried by a guard member with the guard member having trunnion means for supporting the unit for manual rotation into and out of engagement with drive means. Means are provided on the guard member and on adjacent portions of the shaver casing for detenting the unit in operative and non-operative positions.

3,714,711
CUTTER DRIVE MEMBER MEANS FOR ELECTRIC DRY SHAVER
John F. Daniels, Bridgeport, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 30, 1970, Ser. No. 102,639
Int. Cl. B26b *19/10*
U.S. Cl. 30—43.92 3 Claims



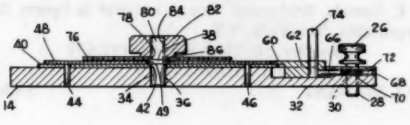
An electric dry shaver having a cutter head comprising a stationary and a movable cutter, a drive member for said movable cutter, and a motor for effecting operation of said drive member. Means are provided for mounting the drive member on the motor and which means include a plate member secured to the motor housing and detachable clamp means provided for detachably securing the drive member to the plate.

3,714,712
CUTTING OR GROOVING TOOL
Joseph Willard Hoffman, Liverpool, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 18, 1971, Ser. No. 116,431
Int. Cl. B23d *21/04*
U.S. Cl. 30—95 **13 Claims**



A tool provided with a plurality of cutting blades received in a carriage which is pivotally mounted to the tool for engaging and disengaging the cutting blades on a pipe. A compressed coil spring forcefully urges the cutting blades to penetrate into the pipe and a stop means is provided to limit penetration of the cutting blades. The tool is further provided with a removable cradle which adapts the tool for use with pipes of varying diameters.

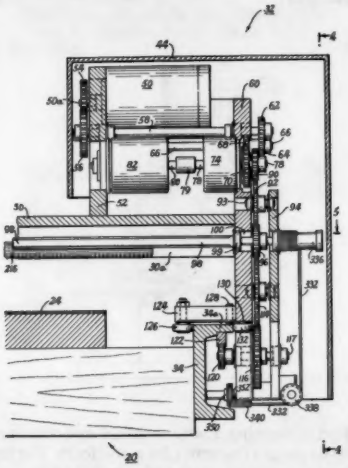
3,714,713
DEVICE FOR CIRCULAR ENGRAVING
Henry C. Jadow, New York, N.Y., assignor to B. Jadow and Sons, Inc., New York, N.Y.
Filed Sept. 15, 1971, Ser. No. 180,574
Int. Cl. B43l *13/10*
U.S. Cl. 33—23 K **7 Claims**



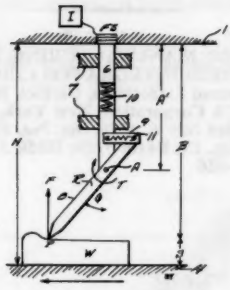
A device for circular engraving for use with a pantographic engraving apparatus or the like which employs a circular character disk mounted on a support member about an axis of rotation. The character disk has a plurality of spaced, circumferentially arranged tracing characters (the letters of the alphabet and/or numerals). A circular layout disk overlies the character disk and is mounted for rotation about the same axis as for the character disk. The layout disk has a diameter which does not exceed the diameter of the character disk. Means is provided for releasably securing the layout disk to the support member while permitting the character disk to be rotated with respect to the support member and the layout disk.

3,714,714
DRAFTING MACHINE
Edward P. Bullard, III, MTD Bldg., 171 Spring Hill Rd., Trumbull, Conn.
Filed Feb. 12, 1971, Ser. No. 114,832
Int. Cl. B43l *13/02*
U.S. Cl. 33—80 **12 Claims**

The disclosed drafting machine comprises a drafting head coupled to a main carriage supported on a main rail for movement parallel to a transverse axis. Parallel top and bottom rails support main rail carriages for movement parallel to a longitudinal axis of the main rail pursuant to positioning the drafting head to any point on the drafting surface. A drive train is incorporated for precise point to point positioning of the drafting head either under manual positioning control or automatic positioning control on the basis of numerical positioning data inputs.



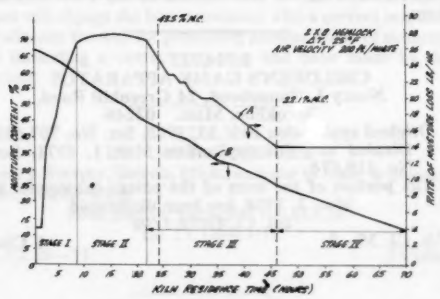
3,714,715
GRINDING CONTROL SYSTEM
Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.
Filed May 25, 1971, Ser. No. 146,756
Int. Cl. G01b *7/28*
U.S. Cl. 33—174 R **9 Claims**



A method for determining and controlling the distance between a variable surface and a point on a device which contacts the variable surface, requiring measurement or control solely of quantities relating to the contacting device where a reference point A on the contacting device is constrained to move along a line A′ and a point of contact P from the contacting device is constrained to follow the variable surface and the angle ϕ between the line of constraint A′ and a radial line R between the points A and P has a non-zero value. The method requires the measurement of at least four of the following five quantities: the length of line A′ from a reference plane to point A, the length of the radial line R, the angle ϕ, the force F acting upon the reference point A due to the contact of the contacting device with the variable surface

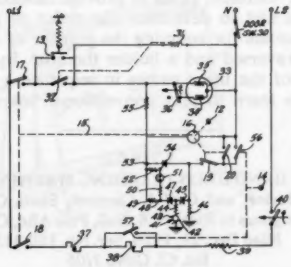
measured along the line of constraint A', and the torque T due to the contact with the variable surface which acts around the point A. Once these quantities are measured, the distance B between the variable surface and the point A along the line of constraint A' may be determined by using the equations $B=A'+R\cos\phi$ and $T=FR\sin\phi$. Control of the quantities shown in the above equations can, of course, control the distance B.

3,714,716
PROCESS FOR KILN DRYING LUMBER BY MEANS OF A PREDETERMINED DRYING RATE
Dallas S. Dedrick, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed June 29, 1970, Ser. No. 50,561
Int. Cl. F26b *3/00*
U.S. Cl. 34—30 **47 Claims**



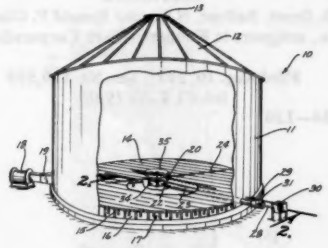
An improved process for kiln drying wood with a conditioned circulating fluid, such as heated air, is described. A desired rate of moisture loss is initially chosen. This rate is achieved and maintained by control of the rate of energy transfer from the fluid to the wood. In contrast to prior art methods, the rate of energy loss from the fluid to the wood is here held as an independent variable. This energy loss is sensed and the entering air is allowed to assume whatever temperature necessary to maintain the selected rate of moisture loss. The entering air dry bulb temperature thus becomes a dependent variable.

3,714,717
KNIT CYCLE FOR CLOTHES DRYER
William L. Beard, Jr., Benton Harbor, and Ronald E. Hahn, St. Joseph, both of Mich., assignors to Whirlpool Corp., Benton Harbor, Mich.
Filed Dec. 11, 1970, Ser. No. 97,242
Int. Cl. F26b *13/10*
U.S. Cl. 34—45 **5 Claims**



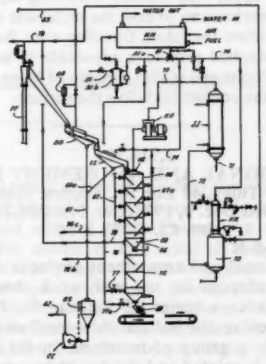
A knit cycle is provided for clothes dryers to prevent shrinkage caused by excessive drying due to inadertent presetting of the dryer programmer to an excessively dry setting. During an automatic drying cycle, moisture sensing apparatus is employed to stall or interrupt operation of a cycle terminating timer motor. Selection of a knit cycle overrides an incorrect setting by limiting the ability of the moisture sensing apparatus to affect the operation of the timer motor.

3,714,718
CONTROL SYSTEM FOR GRAIN DRYING BIN
Eugene G. Sukup, Sheffield, Iowa
Filed March 18, 1971, Ser. No. 125,672
Int. Cl. F26b *13/12*
U.S. Cl. 34—56 **11 Claims**



A control system for grain drying bins of the type adapted to receive wet grain, remove moisture from the grain by the passage of heated air therethrough, and discharge dried grain. A portion of the heated air passing through the grain in the bin escapes through the grain discharge means, and the humidity of this escaping air is indicative of the moisture content of the grain being discharged. A humidity measuring device capable of controlling the on-off operation of the grain discharge means is located near the dried grain discharge outlet and is set to cause the discharge means to operate when the humidity of the air passing it is below a preselected level.

3,714,719
APPARATUS FOR DESOLVENTIZING SOLVENT EXTRACTED MILLED RICE AND RICE BRAN
Truman B. Wayne, c/o Truman B. Wayne & Assc., P.O. Box 13086, Houston, Tex.
Division of Ser. No. 695,632, Jan. 4, 1968, which is a continuation-in-part of Ser. No. 529,814, Feb. 24, 1966. This application Feb. 1, 1971, Ser. No. 111,632
Int. Cl. F26b *21/06*
U.S. Cl. 34—74 **4 Claims**



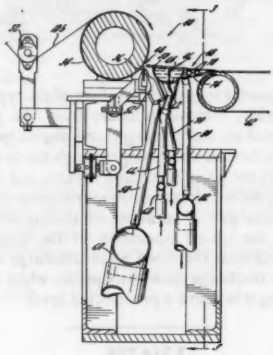
A method and apparatus of desolventizing previously solvent extracted milled rice and, in certain embodiments of the

invention, desolventizing of the bran removed from the rice. The method and apparatus contemplates using a desolventizing gaseous medium comprising inert gas as the major component thereof wherein the gaseous medium is contacted with the rice when at a temperature in the range from about 100° F. to about 150° F., whereby the solvent is vaporized from the rice at a relatively low temperature, thereby preserving the quality of the rice. The gaseous medium with the vaporized solvent entrained therein is subsequently condensed to remove the solvent therefrom and the medium is subsequently heated and recycled.

3,714,720
APPARATUS FOR COOLING A TRAVELING WEB OF MATERIAL

Adrian D. Drost, Balfour, N.C., and Ronald P. Glanz, Covington, Va., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 10, 1971, Ser. No. 170,559
Int. Cl. F26b *19/00*
U.S. Cl. 34—120 **12 Claims**



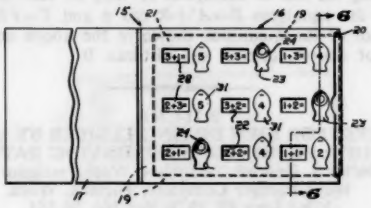
A cooling apparatus for cooling a traveling web of fabric having adhesive which must be rapidly set. The apparatus includes a heat conductive bed surface having a transverse upstream edge where the fabric is received. An upwardly directed air jet cools as well as partially supports the web as it passes onto the bed surface. Immediately downstream of the air jet are two liquid cooling mechanisms that have the bed surface as an upper wall thereof. A cooling liquid is pumped through the mechanisms to cool the underside of the bed surface and therefore the fabric traveling over the surface. The elevation of the bed surface is adjustable to suit the desired running conditions and is also capable of being raised to permit access to the equipment below the surface.

3,714,721
EDUCATIONAL AND AMUSEMENT DEVICES

Charles L. Tilley, 41 Elm St., Saugus, Mass. 01906

Filed Dec. 9, 1971, Ser. No. 206,261
Int. Cl. G09b *3/02*
U.S. Cl. 35—9 R **13 Claims**

An educational and amusement device is disclosed that has a board adapted for use with work sheets having on their front faces a series of indicia, the board having openings exposing the indicia. A second series of indicia is provided by a group of members on the front face of whice indicia is printed and the board has means enabling any member to be associated with the indicia exposed in any of the openings. Both the back face of the work sheet and the back of the member have code means exposed at the back of the board enabling the correctness of the relationship of the members to the exposed indicia to be

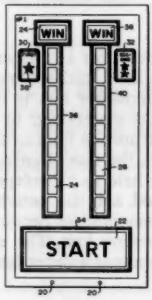


determined thereby. The device may be provided with a shield covering the code means but movable to expose them.

3,714,722
CHILDREN'S GAME APPARATUS

Nancy L. Sonnabend, 24 Greenhill Road, Brookline, Mass. 02146

Original application Feb. 23, 1968, Ser. No. 707,681. Divided and this application Mar. 1, 1971, Ser. No. 119,674
The portion of the term of the patent subsequent to Mar. 2, 1988, has been disclaimed
Int. Cl. G09b *1/00*
U.S. Cl. 35—8 **8 Claims**



This invention relates to apparatus for playing an instructional series of games. The apparatus is constructed and arranged to enable a very young child to learn, by playing the games in sequence, the necessary abstract concepts required to play conventional board games. The preferred embodiment of the invention includes a game board having printed thereon three different playing surfaces, two sets of counters, each of a different color and a container therefor, cards to provide random counts for the players and to determine the order of play, a card holder, counters for counting the number of times a path has been traversed and a holder therefor. By learning to play each of the three games in sequence a young chlid will readily learn to play conventional board games.

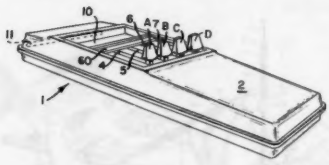
3,714,723
HAND HELD TEACHING MACHINE

David A. Horine, and Carl J. Clement, Santa Clara County, Calif., assignors to Richard B. Ball, Palo Alto, Calif.

Filed Dec. 21, 1970, Ser. No. 100,313
Int. Cl. G09b *3/06*
U.S. Cl. 35—9 A **10 Claims**

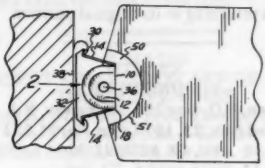
A hand held manually operable teaching machine is disclosed herein comprising a replaceable cartridge containing a

web, typically an endless or Z-folded web and a plurality of manually operated slideable web-advancing means. The web is used for displaying frames of material to which a response is intended. Each frame of material on the web is provided with a web advancing hole at a predetermined location on a line transverse to the web in associated with an appropriate one of



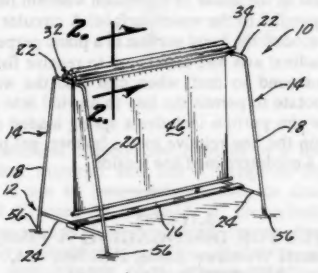
several possible responses displayed with the material. The advancement of a pre-determined one of the web-advancing means will engage the hole associated with a correct response and advance the web for presenting another frame of material, thus indicating a correct response had been made by the operator.

3,714,724
DISPLAY MARKER CLIP
Robert J. Slavsky, Detroit, Mich., assignor to Shaw & Slavsky, Inc., Detroit, Mich.
Filed July 16, 1971, Ser. No. 163,387
Int. Cl. G09f *3/18*
U.S. Cl. 40—11 **3 Claims**



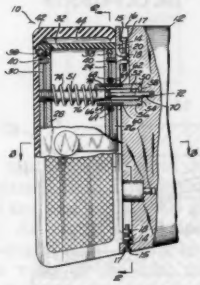
A spring clip is provided with retaining means for holding an associated attention directing card and is also provided with side wall flanges for snapping into grooves of a conventional C-shaped price tag molding with which the clip is used.

3,714,725
DEVICE FOR DISPLAYING SHEET MEMBERS HAVING INDICIA THEREON
Gary R. Banks, Rte. 2, Westfield, Iowa 51062
Filed May 27, 1971, Ser. No. 147,393
Int. Cl. G09f *11/08*
U.S. Cl. 40—84 **8 Claims**



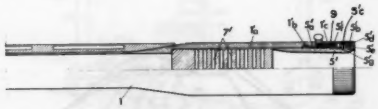
A device for displaying sheet members having indicia thereon is comprised of a support frame and an elongated spindle rotatably mounted in the support frame for rotation about a horizontal axis. A plurality of sheet members having indicia thereon are rolled into cylinders and are detachably mounted to the spindle. Complementary brackets are provided on the spindle and on each cylinder for detachably holding the cylinders to the spindle.

3,714,726
RECOIL STOCK
Paul E. Braun, 8325 S.W. 72nd, Miami, Fla.
Filed Nov. 25, 1970, Ser. No. 92,559
Int. Cl. F41c *23/00*
U.S. Cl. 42—74 **11 Claims**



A rubber membrane is sealed between a pair of front and back plates forming a fluid filled chamber secured to the butt end of a gun stock. The shock caused by the firing of the gun is translated to the fluid chamber causing the rubber membrane to expand radially with respect to the gun axis resulting in relative movement of the front and back plates toward each other to absorb and relieve the user of the shock impact. A pair of spring loaded pistons longitudinally positioned between the front and back plates provide proper realignment of the recoil pad after firing. A U-shaped spring clamp prestresses the fluid chamber to provide immediate shock absorbing expansion of the membrane when the gun is fired.

3,714,727
GUN BARREL
Hideo Iino, Mito, Japan, assignor to SKB Arms Company, Tokyo, Japan
Filed Aug. 25, 1970, Ser. No. 66,692
Claims priority, application Japan, Aug. 28, 1969, 44/81175; Aug. 28, 1969, 44/81176
Int. Cl. F41c *21/00*
U.S. Cl. 42—79 **2 Claims**



A gun barrel which comprises a relatively large-diametered portion formed integrally with a barrel body in the forward end thereof and adapted to incorporate an exchangeable choke inside the muzzle of said relatively large-diametered portion, said relatively large-diametered portion being formed coaxially with the gun barrel body ; a means for securely holding said choke therein; and/or gas vents formed in the substantially upper part of said relatively large-diametered portion to release gas jets therefrom, thereby preventing an undesirable bounce of the gun barrel at firing.

In the gun barrel of the present invention, the total length of the barrel can always be constant and the replacement of

chokes is easily made without causing a change in the balance of said barrel.

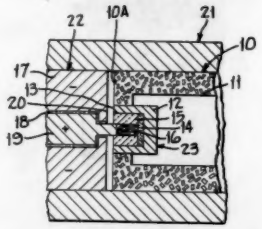
Moreover, an undesirable bounce of the gun barrel is effectively prevented by forming the gas vents in only the upper part of the barrel.

3,714,728

COMPRESSIBLE PRIMER CONTACT AND FIXED FIRING PIN ASSEMBLY

William E. Perkins, Runnemede, N.J.; Allen F. Schlack, Churchville, and Thomas Q. Ciccone, Langhorne, both of Pa., assignors to the United States of America as represented by the Secretary of the Army

Filed Dec. 22, 1970, Ser. No. 100,742
Int. Cl. F41b 5/18
U.S. Cl. 42—84 **6 Claims**



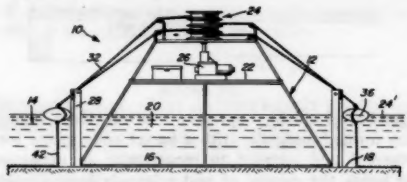
A compressible primer contact plug and fixed firing pin assembly combination for use in small caliber electrically actuated caseless ammunition and small arms weapons. The primer contact is operationally interposed between a priming mixture and a firing pin or center electrode which is an integral part of a small arms weapon bolt assembly and is affixed thereto. Undesirable propellant gas leakage is obviated in the firing pin area by the fixed firing pin bolt assembly which acts as an obturator during the ballistic cycle. The primer contact plug is located slightly below flush with respect to the rear surface of the caseless cartridge and from that position, tolerates longitudinal compression to assure good electrical conduction to the sensitive priming mixture while compensating for variations in the seating depth of the primer assembly.

3,714,729

FISH HARVESTING METHOD AND APPARATUS

John R. Moise, 115 Central Avenue, Houma, La.

Filed Feb. 9, 1971, Ser. No. 113,871
Int. Cl. A01k 79/00
U.S. Cl. 43—4.5 **7 Claims**



Fish and other marine life are harvested by establishing electric field barriers in a body of water enclosing a relatively large volume that is contracted toward a central collection zone with which the fish are concentrated. The electric fields are formed between flexible electrodes suspended from floats that are moved toward the collection zone by cables extending from a frame mounted at the collection zone.

3,714,730

FISHING LEAD

Kenneth R. Lloyd, 66 Chaparell Ranch Road, Cleveland, Tex.

Filed Dec. 8, 1970, Ser. No. 96,026
Int. Cl. A01k 97/00
U.S. Cl. 43—17.2 **3 Claims**

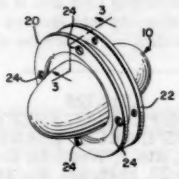
A fishing lead having a yieldably mounted connection to a fishing line, fish hooks having other leads thereon being yieldably connected laterally to the fishing lead, and a sinker connected by yieldable means to the lower end of the fishing lead. When tension is placed on one of the yieldable means, as when one of the members becomes stuck, and upon release of the tension, the member will be released by the force of the yieldable means returning to its original position.

3,714,731

FISHING DEVICE

Richard J. Benson, P.O. Box 256, Rockaway, N.J.

Filed Nov. 23, 1970, Ser. No. 91,852
Int. Cl. A01k 93/00
U.S. Cl. 43—43.11 **19 Claims**



A fishing bobber wherein an elongated buoy portion is shaped to float in the water in a position wherein its longitudinal axis is parallel to the water surface. A circular rim portion extends around the buoy portion in a plane perpendicular to the longitudinal axis and is adapted to receive fishing line wound therearound so that, when cast into the water, the bobber will rotate to permit the line to unwind into a fishing position. The rim portion includes a spring loaded clamp in order to retain the line relative to the bobber, yet permit its release upon a predetermined line tension.

3,714,732

APPARATUS FOR DISENGAGING A FISHHOOK

Samuel Woodrow Little, P.O. Box 404, Milledgeville, Ga. 31061

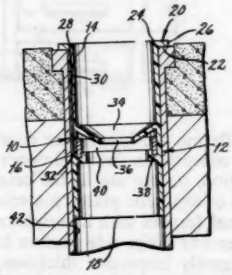
Filed Dec. 17, 1970, Ser. No. 99,026
Int. Cl. A01k 97/00
U.S. Cl. 43—53.5 **11 Claims**

An apparatus for removing a fishhook lodged in the flesh of a fish including means for rotating a lodged fish-

hook with control means operatively associated with the rotating means for effecting a rotation of said rotating means so as to disengage the fishhook from its engaged placement and to retrieve the fishhook from the fish. The apparatus provides a novel method for automatically disengaging a fishhook from the flesh of a fish including the steps of wrapping the fishline attached to the hook around

a fishhook rotating means and rotating the rotating means, thereby dislodging the fishhook from the fish. Another method disclosed for automatically disengageng a fishhook from the flesh of a fish includes the steps of wrapping the fishing line attached to the hook around a fishhook rotating means, engaging the fishhook with the rotating means, and rotating the rotating means whereby the fishhook will be disengaged from the flesh of the fish.

3,714,733
INSECT GUARD FOR SEWER AND DRAIN OPENINGS
Michael A. Madonna, 1900 Thunderbird Ave., Florissant, Mo. 63033
Filed Nov. 2, 1970, Ser. No. 86,133
Int. Cl. A01m *1/20*
U.S. Cl. 43—121 **5 Claims**

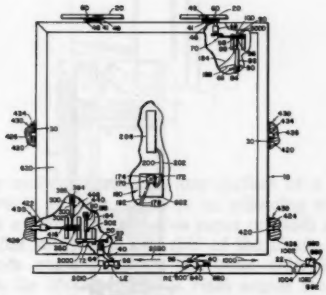


A cylindrical shaped tube is made of a low coefficient of friction material and has a flange at its upper end so that it can be inserted into sewer or drain openings. Centrall disposed on the inside of the cylindrical shaped tube are means for preventing insects from crawling upwardly therethrough. The disclosure shows three distinct embodiments of such centrally disposed means, among which are two mechanical means which completely close up the sewer or drain openings and another means which presents a physical obstacle to insects along with means for poisoning the insects as they attempt to crawl upwardly through the tube.

3,714,734
TOY AIRCRAFT
John Edwin Livingston, 502 Camp St., New Albany, Ind. 47150
Filed Mar. 1, 1972, Ser. No. 230,647
Int. Cl. A63h *27/00*
U.S. Cl. 46—76 R **8 Claims**

Discloses a toy aircraft formed by folding a blank of stiff sheet material into a configuration having a vertically disposed keel and horizontally disposed and tapered wing portions. An elongated clamping and stabilizing member consisting of a bar having an elongated slot and fitted over the walls of the keel portion clamp same together and maintain the keel in vertical disposition while in flight. In one embodiment, two folded members are produced from two blanks of stiff sheet material and these are clamped into abutting and congruent relationship so as to produce a finned missile. This is accomplished through the use again of an elongated clamping and stabilizing member.

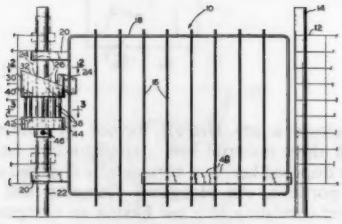
3,714,735
HYDRAULICALLY OPERATED RAILROAD CAR DOOR
Robert E. Owen, 10908 Walling Circle, Omaha, Nebr. 68144
Filed June 7, 1971, Ser. No. 150,706
Int. Cl. E05d *15/10*; E05f *15/06*
U.S. Cl. 49—220 **12 Claims**



An actuating mechanism for laterally moving a sliding door of the plug type into and out of the door opening utilizing four independent crank arms, each rotatably journaled at opposite end portions to the sliding door and the supporting door track, respectively. The journaling being by vertical shafts each forming a crank arm and shaft assembly with the respective arm, hydraulic cylinder door opening and closing actuation means connected to said assemblies, and manually controllable hydraulic pressure supply means operating said hydraulic cylinders for

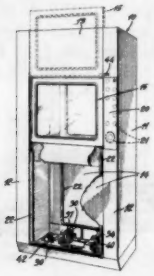
opening and closing said door. Latching assemblies at the sides of said door and controlled by hydraulic cylinder means which latter is operably correlated with said manually controllable hydraulic pressure supply means and unlatching said door before it opens and latching said door after it closes.

3,714,736
GATE STRUCTURE
George D. Weaver, Weaver Road, Myrtle Creek, Oreg.
Filed May 26, 1971, Ser. No. 146,919
Int. Cl. E05f *1/04*
U.S. Cl. 49—237 6 Claims



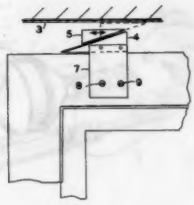
A gate slidable along and pivotal on a stanchion carries a roller engaging a cam surface on a cam block to close the gate and stop the gate in a closed position. The block is rotatable on the stanchion and is connected by torsion rods to a collar fixed to the stanchion.

3,714,737
OPERATING MECHANISM FOR VERTICALLY SLIDING DOOR
Paul-Henri Fillion, Ste-Foy, Quebec, and Viateur Guay, Charlesbourg, Quebec, both of Canada, assignors to Hoplab Inc., Quebec, Canada
Filed Feb. 8, 1971, Ser. No. 113,488
Int. Cl. E05f *15/08*
U.S. Cl. 49—360 7 Claims



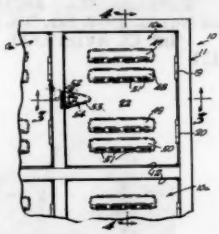
The invention relates to operating mechanism for a vertically sliding door of a washing machine for laboratory equipment in which the door is raised to the open position by hydraulic pressure and is lowered to the closed position by gradually releasing the hydraulic pressure in such a way that during the downward run of the door the same is only under the influence of its own weight, so as to avoid accidental injury to the operator or damage to the equipment being washed.

3,714,738
SLIDING GLASS DOOR RETAINER MEANS
Sidney Koslow, 6845 N.W. 9th St., Margate, Fla., and James P. Malone, 1 Odell Court, Syosset, N.Y.
Continuation-in-part of Ser. No. 848,032, Aug. 6, 1969, abandoned. This application June 11, 1971, Ser. No. 152,169
Int. Cl. E05d *13/00*
U.S. Cl. 49—404 3 Claims



One or more adjustable retainers are mounted on top of a sliding glass door at the corners, or suitably spaced, to fill in the space between the sliding glass door and the inside of the upper track so that the sliding glass door cannot be lifted vertically from the outside by unauthorized persons. The fastener comprises two adjustable wedge members which are secured to the door or the track.

3,714,739
DOOR FOR BOX LOCKERS AND THE LIKE
Daniel D. Dolan, 2610 SW. 28th Lane, Miami, Fla. 33145
Filed Dec. 3, 1971, Ser. No. 204,600
Int. Cl. E06b *3/00*
U.S. Cl. 49—501 10 Claims

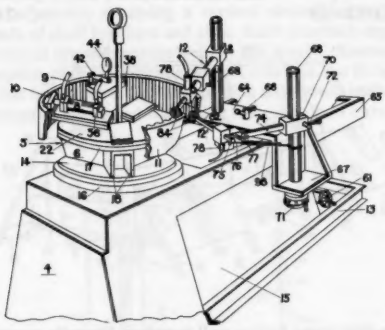


An integrally molded box locker door is described, for use either in substitution for steel doors in ordinary lock box construction, or for use in the original construction of lock boxes of synthetic plastic materials. A rectangular door face panel formed with a peripheral skirt defining a vertically-extending hinge side portion having a wall section of divergently increasing thickness, with respect to which hinge leaves are adapted to secured for hinging for the door to a lock box opening, is described, whereby, due to the resilience of the skirt hinge side with respect to the face panel, spring action operative to prevent door slamming is effected.

3,714,740
GEAR DEBURRING DEVICE
Frank J. Steinhardt, 2208 E. 9th St. S., Salt Lake City, Utah 84108
Filed Aug. 24, 1970, Ser. No. 66,373
Int. Cl. B24b *9/00*
U.S. Cl. 51—33 6 Claims

A device for simultaneously deburring both faces of a centerless gear. The deburring device includes a centerless

gear holding means having a plurality of extendable arms radially mounted to a rotatable table. Each of the arms has a resilient member at its outer end which when extended radially by hydraulic means, contacts and exerts a

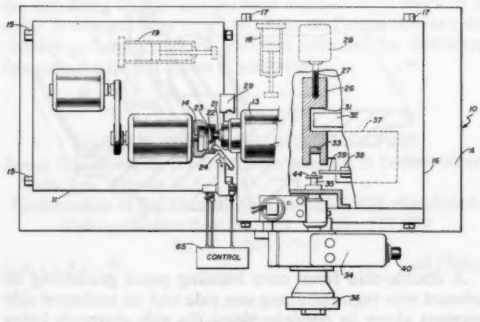


force on the inner walls of the centerless gear. The amount of hydraulic force exerted is sufficient to hold the gear suspended in a "floating" relationship above a support surface. A pair of abrasive spindles are carried on the gear holding means for gear deburring.

3,714,741
GRINDING MACHINE WITH SIZE CONTROLLED DRESSING MEANS

Herbert R. Uhtenwoldt, Worcester, and Diran Deranian, Holden, both of Mass., assignors to Cincinnati Milacron-Heald, Worcester, Mass.

Filed Feb. 24, 1971, Ser. No. 118,317
Int. Cl. B24b *51/00*
U.S. Cl. 51—165.91 **10 Claims**



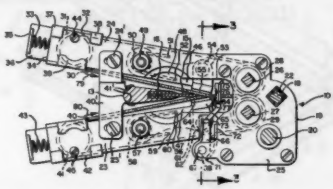
A grinding machine having a feed means for producing a controlled force between the abrasive wheel and the workpiece and having means for changing the limits of rapid infeed, if dressing takes place during a grinding cycle.

3,714,742
KNIFE SHARPENING MECHANISM

Frederick G. Clark, Buffalo, N.Y., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed July 15, 1971, Ser. No. 162,922
Int. Cl. B24b *19/00, 2/00*
U.S. Cl. 51—246 **8 Claims**

A knife sharpening mechanism for a cutting machine having an elongated knife comprising a grinder carriage having an upper leg and a lower leg, an upper endless abrasive belt mounted on the upper leg, a lower endless abrasive belt mounted on the lower leg, drive means for driving said belts, an upper belt guiding shoe for holding said upper belt in engagement with said knife, a lower belt guiding shoe for holding said lower belt in engagement with said knife, biasing means for urging said lower shoe in a direction toward said knife, detent means for holding said lower shoe against movement toward said knife as said carriage moves longitudinally of said knife while permitting said shoe to move away from said knife

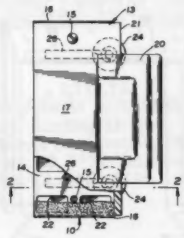


when the pressure between said knife and said shoe exceeds the pressure of said biasing means urging said shoe toward said knife, said detent means comprising a finger attached to said lower shoe for engagement with a plurality of serrations on a pivotal arm on said carriage, said serrations being of a configuration to permit said finger and said lower shoe to move away from said knife but preventing said lower shoe from moving toward said knife while said finger is in engagement with said serrations, and cam means for periodically resetting said lower shoe in a direction toward said knife.

3,714,743
SQUARE EDGE SANDING TOOL

Ronald B. Hall, P.O. Box 365, Alliance, Ohio 44601

Filed Nov. 11, 1971, Ser. No. 197,706
Int. Cl. B24d *15/02*
U.S. Cl. 51—392 **6 Claims**



A sanding tool for smoothing one surface of a board or similar article at right angles to an adjoining surface. The tool has a block and abrasive paper or cloth is held taut over a flat surface on one side of the block, and a handle extends angularly from the other side. Rollers journaled on the block extend at right angles from the flat surface for bearing on the adjoining surface of the article being sanded.

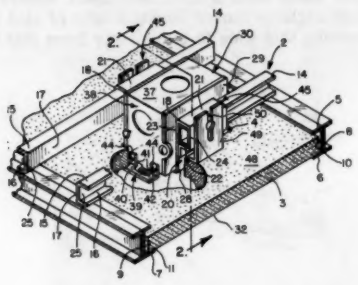
3,714,744
ELECTRICAL FIXTURE HANGER

Joseph J. Koziarz, 5830 W. Leland Ave., Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,364
Int. Cl. E04g *17/18*
U.S. Cl. 52—28 **10 Claims**

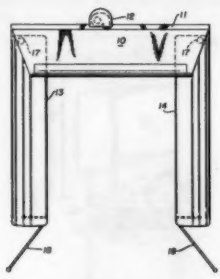
A support for an electrical fixture from a ceiling tile or ceiling wall structure of low tensile strength, comprising a junc-

tion box fitted between load spreading beams positioned to overlie the structure. A pair of bendable hanger straps are hooked over the beams and flank the box which is held with its lower edge flush with the ceiling surface. The straps are bent



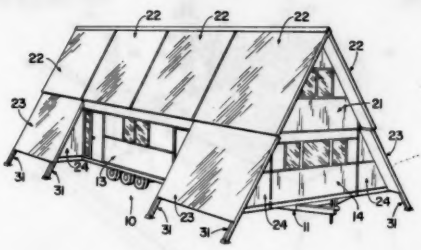
at their lower ends upwardly into the box under its lower edge, and thus hold the box with its lower edge aligned with the ceiling surface. A clamping foot is mounted on each hanger and presses against the top of the tile, and the box has big extensions which bear against the bottom of the tile.

3,714,745
INFLATABLE DOCK SEAL
Larry O'Neal, 4953 Timbercrest Drive, Canfield, Ohio 44406
Filed Nov. 8, 1971, Ser. No. 196,471
Int. Cl. E06b 7/22
U.S. Cl. 52—2 **6 Claims**



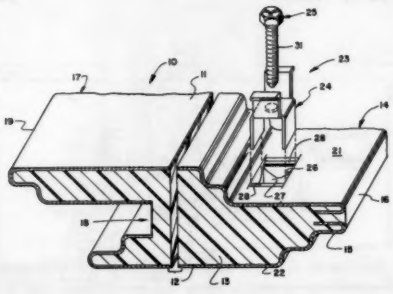
An inflatable dock seal for closing an opening such as a loading dock with respect to a truck or trailer includes an upper horizontal inflatable member movable downwardly against the top of the truck or trailer and a pair of vertical inflatable members movable outwardly in curving configurations to engage the sides of the truck or trailer. The horizontal and vertical inflatable members are closed with respect to one another at their junctions and the vertical inflatable members are arcuate in inflated configuration so as to move outwardly and toward one another restricting the opening in which the truck or trailer is positioned. The inflatable members are formed of waterproof fabric and means for inflating the same is provided and means for resiliently retracting the members when non inflated are also provided.

3,714,746
EXPANDABLE A-FRAME TYPE TRAILABLE BUILDING STRUCTURE
Richard A. Barlow, 2008 Dundee Road, Rockville, Md. 20850
Filed Nov. 5, 1970, Ser. No. 87,071
Int. Cl. E04b 1/343
U.S. Cl. 52—69 **2 Claims**



A mobile home having wall members hingedly mounted to the structure for allowing the members to assume an outwardly extending angularly oriented position. Floor extensions are moved for connection with wall members to form additional living space. Telescoping braces are connected to the lower wall members and engage the ground thereby stabilizing the structure.

3,714,747
FASTENING MEANS FOR DOUBLE-SKIN FOAM CORE BUILDING PANEL
Bernard E. Curran, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.
Filed Aug. 23, 1971, Ser. No. 174,105
Int. Cl. E04c 1/10, 2/20
U.S. Cl. 52—309 **6 Claims**

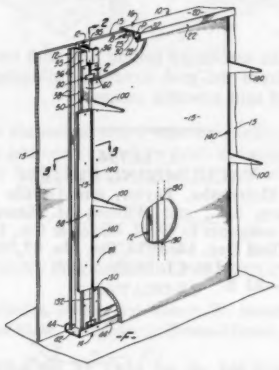


A double-skin foam core building panel presenting an inboard side segment along one side and an outboard side segment along its opposite side—the side segments being adapted to be assembled in lapped interfitted relation without externally visible fasteners. Hidden fastening means in the form of a clip and fastener is provided for securing the inboard side segment of the panel to the subgirt of a structural framework.

3,714,748
SUPPORT STRUCTURE FOR SHELVING
Peter Costruba, Pico Rivera, Calif., assignor to Angeles Metal Trim Co., Los Angeles, Calif.
Filed Jan. 2, 1970, Ser. No. 48
Int. Cl. A47g 29/02
U.S. Cl. 52—36 **3 Claims**

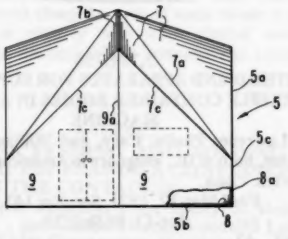
A pair of upstanding channeled studs are positioned vertically between an overlying horizontal cap and a horizontal

floor track positioned beneath and parallel to the cap. The studs have main webs spaced apart to receive a pair of elongated upstanding substantially T-shaped interlock members which are secured in opposed substantially parallel relationship between the webs of the studs. Each interlock member has reversely folded portions to provide shallow spaced channels for adjustably receiving a vertical slotted bar and the inner ends of shelf brackets and clips. Each interlock member has a vertical inward passage behind the spaced channels for the reception of the inner ends of shelf brackets. An elongated slotted bar having a vertical row of slots is disposed in the vertical channels. Elongated stabilizing flanges extend outwardly



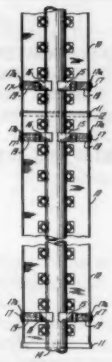
from each slotted bar along each side of the row of slots to stabilize shelf brackets when positioned in the slots. T-shaped clips are inserted into slots near the upper and lower ends of the slotted bar and are secured to the interlock member so that the slotted bar is adjustably anchored in the interlock member. The inner ends of the shelf brackets are inserted between the stabilizing flanges through the slots, and into the vertical passages in the respective interlock members. T-shaped concealing members are inserted vertically between the stabilizing flanges and between adjacent shelf brackets in order to conceal from view the recess that exists between the stabilizing flanges and the junction between the stabilizing flanges and adjacent sheets of wallboard.

3,714,749
PORTABLE BUILDING CONSTRUCTION
James B. Aitken, El Cerrito, Calif., assignor to Instant Structures, Inc., Albany, N.Y.
Continuation of Ser. No. 747,215, July 24, 1968, abandoned. This application Sept. 2, 1971, Ser. No. 177,480
Int. Cl. E04b *1/344*
U.S. Cl. 52—70 **18 Claims**



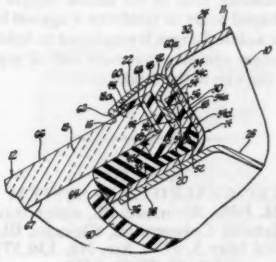
A building construction having a collapsible roof and a collapsible floor coupled to the roof, whereby the floor and roof form a unit which can be alternately expanded and collapsed. The roof unit has a number of hingedly interconnected sections and the floor unit has a plurality of hingedly interconnected panels with the sections and panels being disposed to permit the same to be substantially parallel with each other when the roof and floor are collapsed. When expanded, the roof forms side openings which can be at least partially covered by sidewall panels hingedly connected to the adjacent roof sections.

3,714,750
COVERING FOR RISER OR THE LIKE
Nicholas Pallotto, 1865 55th St., Brooklyn, N.Y.
Filed April 27, 1970, Ser. No. 32,221
Int. Cl. E04f *19/00*
U.S. Cl. 52—728 **4 Claims**



Covering or casing for unprotected risers adjacent interior walls, which consist of vertical supply or return pipes for steam, water, gas, sewer and the like, further to be used for covering of support posts for ceiling beams, horizontal pipe lines such as sprinkler pipes. The covering has adjustable spring clips for attaching the same on pipes of various sizes.

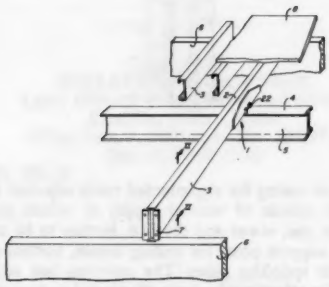
3,714,751
WINDOW ASSEMBLY
Ronald H. Lackey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 20, 1971, Ser. No. 173,363
Int. Cl. E06b *1/36, 3/62*
U.S. Cl. 52—400 **2 Claims**



In a preferred form, this disclosure relates to a window assembly having a support structure within which a glass panel is maintained by a resilient retaining strip. The

resilient retaining strip has a channel portion for slidably engaging the edge of the glass panel to form an oversize sub-assembly. The retaining strip also has a cam surface which is engaged by the support structure to cause the retaining strip to slide inwardly upon the glass panel as the sub-assembly is received within the support structure. The retaining strip further includes a deflectable locking flange means spaced from said channel portion and defining an elongated slot therebetween and which engages the support structure to maintain the assembly therein. The window assembly also includes a reveal molding means which has a flange portion for covering between the structural frame means and the edge of the glass panel. The locking flange also clamps a depending flange portion on the molding means against the channel portion of the resilient strip to hold the molding means in place.

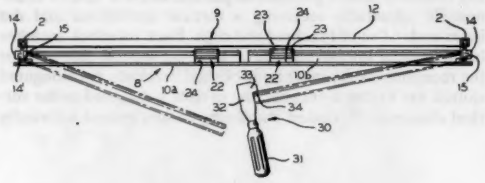
3,714,752
REINFORCING AND SUPPORTING SADDLE FOR C-SHAPED SHEET-METAL BEAMS
George D. Ratliff, Jr., Churchill Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Sept. 25, 1970, Ser. No. 75,393
Int. Cl. F16b *1/00*; EO4c *3/04*
U.S. Cl. 52—665 **5 Claims**



A saddle for supporting and reinforcing the central portion of a C-shaped sheet-metal beam on a transversely extending I-beam or other supporting structure in a building is disclosed. The saddle has a channel shape with a horizontal base or web and flanges extending upwardly from opposite edges thereof, the web providing a support for the bottom flange of the C-shaped beam on the upper surface of the I-beam or supporting wall, and the flanges being effective to reinforce the C-shaped beam against bending. One of the saddle flanges engages the web of the C-shaped beam to reinforce it against bending, and the other of the saddle flanges is employed to hold the bottom flange of the beam against movement out of supporting engagement with the web of the saddle.

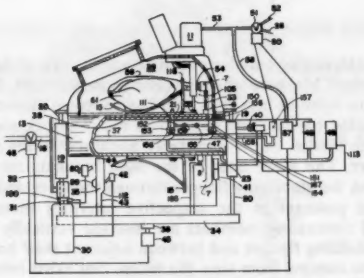
3,714,753
CONCEALED GRID SYSTEM
Reinhardt H. Jahn, Riverside, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.
Filed May 3, 1971, Ser. No. 139,377
Int. Cl. E04b *5/52*
U.S. Cl. 52—484 **22 Claims**

A suspended ceiling grid structure for use in a concealed type of grid system, in which the grid structure may include a pair of main runners between which a plurality of ceiling tiles are to be supported, two spaced runner means extending between the main runners for supporting such ceiling tiles therefrom, with at least one of said runner means including downwardly movable means for



supporting the associated ceiling tile, with such tile being removable from the grid structure following downward movement of said movable means.

3,714,754
VACUUMIZING SYSTEM
Edward L. Holcombe, Taylor, and Orville M. Calvert, Spartanburg, S.C., and William M. Kessel, Wernersville, Pa., assignors to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 14, 1970, Ser. No. 97,703
Int. Cl. B65b *31/02*
U.S. Cl. 53—22 B **9 Claims**

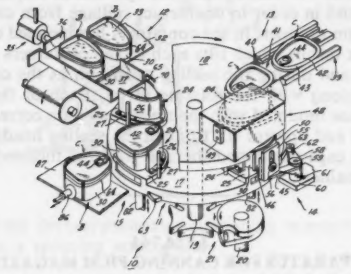


Disclosed is an apparatus and method for vacuum packaging products in containers such as bags. The vacuumizing apparatus includes a vacuum chamber and a vacuum extractor operating independently on the container within the vacuum chamber. In preferred embodiments, the apparatus includes a conveyor for transporting the bagged products and a hood member which, when contacting the conveyor, forms a vacuumizing chamber therewith and the hood member contains means for closing the bag after vacuumizing.

3,714,755
METHOD AND APPARATUS FOR SUPPORTING FLEXIBLE CONTAINER BODIES IN A CLOSING MACHINE
Thomas Lawrence Phalin, Cary, and William Stephen Birkholz, Zion, both of Ill., assignors to American Can Company, Greenwich, Conn.
Filed May 17, 1971, Ser. No. 143,936
Int. Cl. B65b *7/28*
U.S. Cl. 53—42 **10 Claims**

A method and apparatus for supporting flexible open-ended container bodies, such as formed of plastic, in a closing machine are provided in which the body is moved laterally into an open-ended partial supporting mold, an end closure member is positioned in aligned relation with the open end of

the body, a second partial supporting mold is moved against the side wall of the body at the open end of the open-ended partial mold, and both of the partial molds with the body



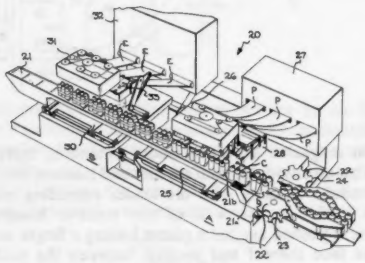
therebetween are moved into a seaming mechanism whereby the side walls and open end of the body are supported by the partial molds during attachment of the end closure to the body.

3,714,756

MACHINE FOR ASSEMBLING GROUPS OF CONTAINERS

John M. MacInnes, Millis, and Robert W. Saumsiegle, Needham, both of Mass., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 21, 1970, Ser. No. 100,034
Int. Cl. B65b *21/00, 27/04*
U.S. Cl. 53—48 **12 Claims**



A method and apparatus for forming packages of containers which have a body portion and a relatively smaller neck portion with abutment means adjacent the upper end of the neck portion. The containers are moved continuously in a predetermined path, segregated into groups or clusters, and an endless band is expanded, moved along in registry with each cluster and finally telescoped and released onto each cluster. At a subsequent position along the path of each cluster a carrier is moved along in registry with each cluster and forced downwardly over the ends of the containers to complete the package.

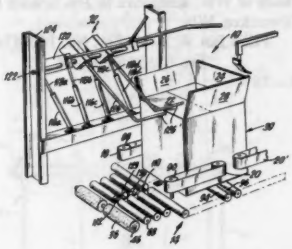
3,714,757

DEVICE FOR FEEDING AND FOLDING THE TRAILING TOP FLAP OF A CONTAINER FOR CLOSING THE CONTAINER

Harold J. Feigel, Teaneck, N.J., Harry S. Reizenstein, Bayside, N.Y., and Gilbert Bloch, Woodcliff Lake, N.J., assignors to FMC Corporation, Horsham, Pa.

Filed Sept. 21, 1971, Ser. No. 182,317
Int. Cl. B65b *7/20*
U.S. Cl. 53—75 **16 Claims**

A device for feeding and closing a top trailing end flap of a container comprises a roller conveyor over which the container is adapted to be passed. The roller conveyor includes an inclined section leading to a top flap closure station which extends substantially horizontally. At the beginning of the horizontal section, there is a rotatable driven roller which engages and feeds the container only after a stop member is moved out of the way to permit passage of the container through the closing section. The stop member is moved downwardly out of the way only after a container, which has been previously closed, is moved to the end of the folding section. The stop returns upwardly to block the next container until the one being folded is completed. The device includes means for straightening the container and feeding it by engaging both sides thereof while the top flaps are folded. An



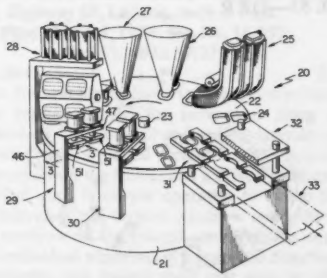
apparatus for folding the trailing or rear end flap includes a plurality of rod members which are carried on blocks on a common support rod. Each block is connected to a fluid pressure piston-and-cylinder combination which is actuated in accordance with the position of the container to move the folding rod member downwardly to engage the trailing top end flap. As the container is moved over the conveyor, electric eye control means are connected to the respective fluid pressure cylinders for each rod member to cause the rod members to move downwardly in succession to engage and successively depress the rear flap until it is fully closed and to hold it downwardly until other means are operable to close the side flaps and other end flap.

3,714,758

METHOD AND APPARATUS FOR FORMING A DEPRESSION IN A COVER MEMBER OF A CONTAINER CONSTRUCTION

George B. Vogeleer, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed March 26, 1971, Ser. No. 128,349
Int. Cl. B65b *7/28, 51/14*
U.S. Cl. 53—39 **19 Claims**



Method and apparatus for forming a depression in a cover member assembled against and closing the open end of a product filled container body comprising a frame carrying a

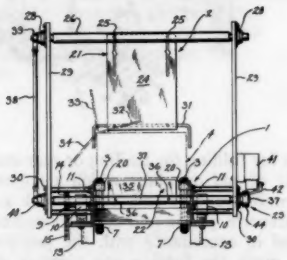
support that is adapted to receive and hold the assembled cover member and container body. A die is movably carried by the frame and is adapted to cooperate with the support for engaging against the cover member and form a depression therein inboard of the open end of the container. Means are operatively interconnected to the frame for moving the assembled cover member and container body off of the support by at least a load relieving amount before the die forms a depression in the cover member to relieve the support from substantially any loading during the cover member depression forming operation.

3,714,759

OPEN FLAP DETECTOR FOR FILLED CARTONS

William G. Pagdin, Milwaukee, and Robert F. Risley, Wauwatosa, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Jan. 4, 1971, Ser. No. 103,474
Int. Cl. B65b *57/04*
U.S. Cl. 53—78 **10 Claims**



Pivotal feelers are disposed above and below the cartons as they are transferred in succession from a flap sealing zone to a palletizing zone to trip a switch adapted to stop the transfer in the event one of the top flaps on a carton comes loose and engages the upper feeler or in the event the bottom sags or a bottom flap drops into engagement with the lower feeler.

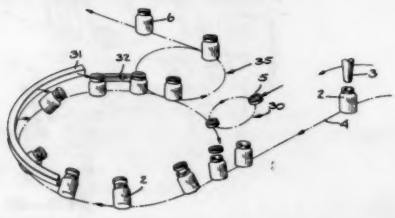
The feelers are mechanically connected to a cam or abutment trip for a switch in the control circuit of a drive motor for the conveyor transferring the cartons from one zone to the other.

3,714,760

HIGH SPEED ROTARY CONTAINER SEALING MACHINE WITH INCLINED SEALING HEADS

Cecil P. Roberts and Charles S. Ochs, Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Mar. 10, 1971, Ser. No. 122,906
Int. Cl. B65b *7/28, 31/00*
U.S. Cl. 53—112 R **22 Claims**



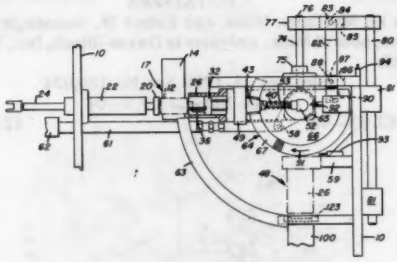
A sealing machine is disclosed for sealing glass or other containers with closure caps. The sealing machine is of the rotary type having a number of sealing heads mounted on a rotating turret for picking up caps at a cap feeding station and for thereafter applying the caps to containers carried in spaced relation beneath the heads by the rotating turret. The sealing machine operates at extremely high speed and in order to counteract spillage from centrifugal forces on products in the containers has inclined container support means which tilts each of the containers inwardly before and during the sealing operation as the containers move along with the rotating turret. Each of the sealing heads are mounted with their axes having a corresponding inward and upward tilt to align the sealing heads and the closure caps positioned thereon with the inclined rims of the containers.

3,714,761

APPARATUS FOR CANNING FILM MAGAZINES

John Herford; Richard R. Mosman; Thomas L. Vieira, and Robert G. Wallace, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 5, 1971, Ser. No. 121,329
Int. Cl. B65b *63/04*
U.S. Cl. 53—118 **13 Claims**



A film magazine having a leader extending therefrom is taken from an automatic film spooler and inserted into a cylindrical transfer housing with the leader extending outwardly through a slot in the wall of the transfer housing. The magazine is pushed against a piston having a finger extending from the face thereof and located between the wall of the transfer housing and the magazine. The transfer housing and the magazine are moved to a canning station and during movement the piston and finger are rotated to rotate the magazine within the transfer housing and thereby wrap the film leader about the magazine. At the canning station the piston pushes the magazine out of the transfer housing and into a storage can which is then placed on a conveyor and fed to a capping machine.

3,714,762

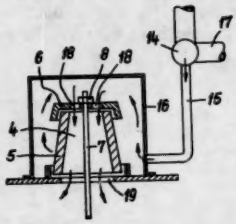
ELECTROFILTER INSULATOR WITHOUT DAMAGING DUST DEPOSITS

Friedrich Fillies, Winz-Niederwenigern, and Günter Urban, Essen-Bredeney, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Aug. 28, 1970, Ser. No. 67,932
Claims priority, application Germany, Aug. 29, 1969, P 19 43 916.8
Int. Cl. B03c *3/34*
U.S. Cl. 55—5 **5 Claims**

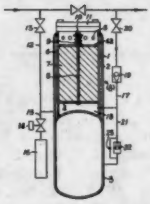
Hot oxidizing gas is passed over electrofilter insulators to reduce the amount of FeO deposited thereon and to

convert any such FeO to Fe_2O_3. The electrofilter is one primarily used to remove pyrophoric dusts, particularly



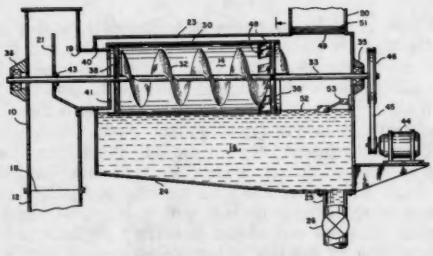
those from carbon-monoxide-containing converter waste gases, in a reducing atmosphere.

3,714,763
DEHUMIDIFYING DEVICE FOR AN AIR BRAKE
Kenichiro Suzuki, 41, 2-chome Negishi-machi, Kanagawa-ken, Yokohama, Japan
Filed Dec. 30, 1970, Ser. No. 102,637
Int. Cl. B01t *53/04*
U.S. Cl. 55—163 **5 Claims**



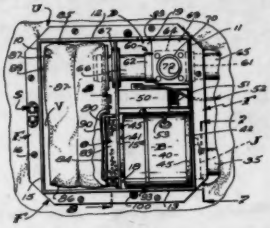
A dehumidifying method and device for an air brake by which air passed through a moisture adsorbent material is accumulated in the air brake reservoir for use. A portion of the dehumidified air is retained and passed back through the adsorbent material to the atmosphere, thereby reactivating the adsorbent material for subsequent use.

3,714,764
BOILER FLUE GAS SCRUBBER
Frank Gething, Milwaukee, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Ill.
Filed Aug. 14, 1970, Ser. No. 63,685
Int. Cl. B01d *47/10*
U.S. Cl. 55—235 **16 Claims**



Pollution control method and apparatus wherein discharge gas containing pollutants is caused to flow between a revolving helical auger-like member and a simultaneously revolving surrounding drum having a film of pollutant absorbing liquid disposed on its surface and caused to flow counter to the gas and into and out of a sump by means of pump vanes carried by the drum.

3,714,765
WALL-MOUNTED VACUUM CLEANER
Carl L. Simonelli, Glendora, Calif., assignor to Central Vac International, Inc., Los Angeles, Calif.
Filed Oct. 19, 1970, Ser. No. 81,647
Int. Cl. B01d *46/00*
U.S. Cl. 55—472 **7 Claims**

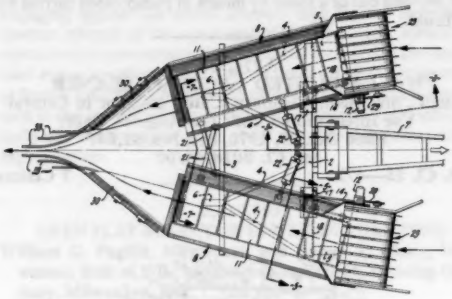


A central power and collector unit for a wall-mounted, built-in vacuum cleaner comprising a case to be engaged in an opening in a wall structure and defining a power chamber and a collector chamber, said case having a mounting flange about its perimeter to engage and to be fixed to the front surface of the wall structure about said opening therein, said case having inlet and outlet ports in its sides to connect with inlet and exhaust ducts within the wall structure and spaced a distance not less than ¾" or greater than 4⅜" rearward of the flange, said unit having an air inlet tube extending from the power chamber into the collector chamber and an outlet port communicating between the collector chamber and a power driven blower in the power chamber, a filter bag in the collector chamber and having an opening receiving the inlet tube, an air conducting orienting pad in the collector chamber overlying the outlet port and having an air conducting inner surface engaging the bag to hold said bag centrally in its related chamber in spaced relationship from the sides of the chamber and having air conducting sides communicating with the space between the sides of the chamber and bag.

3,714,766
MACHINE FOR COMBINING HAY WINDROWS
Herman R. Ender, 29516 S. Bird Rd., Tracy, and Neal H. Collins, 40 W. Highway 50, Lathrop, both of Calif.
Filed March 5, 1970, Ser. No. 16,857
Int. Cl. A01d *57/28*
U.S. Cl. 56—364 **2 Claims**

A machine, for combining hay windrows, comprising a low level mobile frame adapted for movement along a field between individual, longitudinally extending, laterally spaced, pre-formed windrows, a pair of driven, laterally spaced, longitudinal conveyors on the frame, and a driven pick-up reel at the front end of each conveyor operative to sweep the corresponding individual pre-formed windrow upwardly and to deposit said windrow on the related conveyor; the conveyors moving such individual windrows in a rearward direction, converging rearwardly, and having their rear ends in relatively closely adjacent relation whereby the individual windrows are discharged from the rear ends of the conveyors onto the ground in a composite, longitudinally extending, double-size,

central windrow. Additionally, the conveyors are provided at their rear ends with deflectors which cause an inversion of the

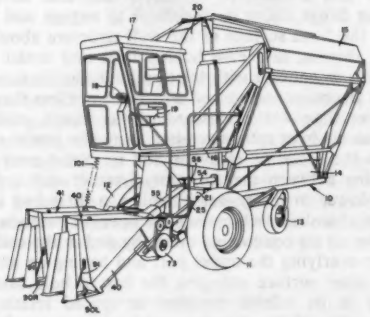


individual windrows as the latter discharge from the conveyors to form said composite central windrow.

3,714,767
CROP HARVESTER

Arthur Lowell Hubbard, and Leon Franklin Sanderson, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Filed June 9, 1971, Ser. No. 151,424
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **7 Claims**



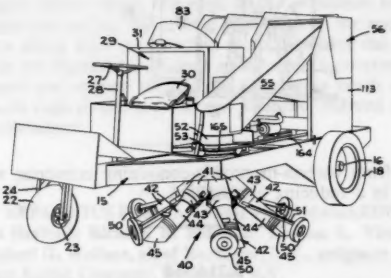
A hydraulically-operated vertical positioning mechanism for a crop harvester that is pivotally mounted on a frame for vertical swinging movement comprising a pair of rigidly-joined and axially-aligned pistons and cylinders that extend between the frame and unit, a ground feeler on the unit operates a valve for one of the pistons and cylinders and a linkage connected to the piston and cylinder and responsive to adjustment of the latter operates a control valve for the other piston and cylinder.

3,714,768
PICKUP AND SEPARATING MACHINE

Joseph M. Patterson, Winter Park, Fla., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 871,316, Nov. 10, 1969, Pat. No. 3,633,738, which is a division of Ser. No. 652,506, July 11, 1967, Pat. No. 3,520,123. This application Aug. 19, 1971, Ser. No. 173,189
Int. Cl. A01d *51/00*
U.S. Cl. 56—328 R **5 Claims**

A pickup and separating machine, which moves along the ground, has a rotor with a plurality of suction tubes extending downwardly and outwardly therefrom. The tubes are vertically movable, and the ends thereof, which move in orbital paths, are maintained closely spaced from the ground by gage wheels. A centrifugal blower draws articles and debris through the suction tubes, rotor, and a suction duct. A centrifugal chamber and a vortex chamber between the duct and the

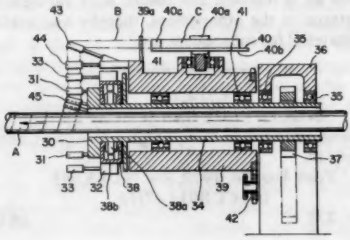


blower separates the light debris from the articles and heavy debris, which fall through a rotary vacuum sealing valve to a conveyor. The conveyor has an upper run which moves larger debris in one direction and has a lower run which moves the nuts and small debris on a grate in the opposite direction. The grate passes the small debris, and the nuts are carried from the grate by an elevator to a receptacle.

3,714,769
METHOD AND APPARATUS FOR CONTINUOUSLY WINDING TAPE ONTO ELONGATED BODY

Seiji Tsuchiya, Kyushu, and Minoru Yabuki and Yoshinori Takada, Yokohama, Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Filed Apr. 23, 1971, Ser. No. 136,915
Claims priority, application Japan, Apr. 25, 1970, 45/35,638
Int. Cl. B65h *81/08*; H01b *7/26*
U.S. Cl. 57—3 **9 Claims**



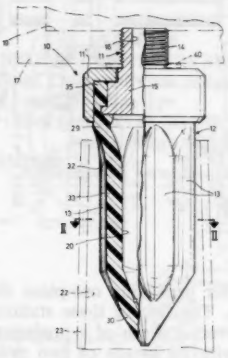
A tape is fed from a tape pad inserted in a tape pad holder through concentrically arranged outer and inner guide discs onto an elongated body. Normally, all of the tape pad holder and outer and inner guide discs are rotated at the same speed to wind the tape onto the elongated body. In case of replacing the tape pad with a new one, a relative speed between the outer and inner guide discs is changed to accumulate the tape onto the outer and inner guide discs and then the tape pad holder only is stopped to replace the tape pad with a new one and connect the front end of the tape from the new pad to the rear end of the tape accumulated around the outer guide disc while continuously rotating the outer and inner guide discs and delivering the accumulated tape onto the elongated body.

3,714,770

INFLATABLE GRIPPER FOR HANDLING SPOOLS OF TEXTILE MACHINES

Ernst Rothke, Schorndorf, Germany, assignor to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung, Ebersbach, Germany

Filed Nov. 9, 1970, Ser. No. 87,873
Claims priority, application Germany, Nov. 7, 1969, P 19 56 035.1
Int. Cl. D01h *9/00*; B66c *1/46*
U.S. Cl. 57—52 **9 Claims**



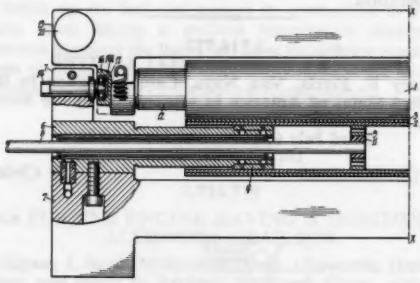
In a mandrel-like gripper assembly for firmly engaging the inner wall of a hollow spool, the inflatable hollow gripper body is formed of an expandable, resilient wall having, in cross section, an undulating, closed configuration.

3,714,771

ROLLER TWISTING APPARATUS

David Ernest Henshaw, Belmont; Werner Emil Otto Knothe, Highton, and Lionel Stern, Kew, all of Victoria, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Feb. 9, 1971, Ser. No. 114,014
Int. Cl. D01h *7/92*; D02g *1/08*
U.S. Cl. 57—77.42 **10 Claims**



Strand twisting apparatus comprising a pair of rollers arranged to form a nip between them and roller drive means to rotate the rollers so as to feed a strand through the nip and to reciprocate the rollers in opposite phase transversely of the strand feed direction. One of said rollers is mounted in a yoke pivotally mounted on the machine frame for movement toward and away from the other roller and biasing means is provided to bias said one roller toward said other roller with a predetermined biasing force.

3,714,772

POLYAMIDE IN COMBINATION WITH POLYCARBONATE, METAL COMPLEX, POLYISOCYANATING AGENT FOR POLYESTER MODIFICATION AND RUBBER TIRE STRUCTURES MADE THEREFROM

Roop S. Bhakuni, Copley, and Joseph L. Cormany, Jr., Akron, both of Ohio, assignors to Goodyear Tire & Rubber Company, Akron, Ohio

Filed March 22, 1971, Ser. No. 126,964
Int. Cl. B32b *25/08*, *27/02*, *27/36*
U.S. Cl. 57—153 **8 Claims**

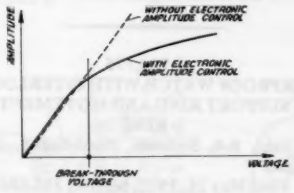
Relates to an improved rubber structure reinforced with an improved polyethylene terephthalate reinforcing fiber modified with a polyamide in combination with a metal complex or this two-component combination in combination with a polycarbonate, or the polyamide in combination with a polycarbonate and a polyisocyanating agent, the modifier being present with the polyester prior to fiber formation.

3,714,773

AMPLITUDE CONTROL MEANS FOR BALANCE WHEEL OSCILLATOR

Gunther Rudolph Diersbock, Waterbury, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Nov. 1, 1971, Ser. No. 194,392
Int. Cl. G04c *3/04*; H02k *33/02*
U.S. Cl. 58—28 B **5 Claims**



A means for controlling the amplitude of balance wheel oscillators used in timepieces which comprises predetermined semiconductor devices connected in parallel across the driving coil of an oscillator. The semiconductor device which may, for example, comprise a diode is mounted on a coil-carrying balance wheel in a simple and expeditious manner. This arrangement when employed in a timepiece having mechanical contacts also minimizes contact wear.

ERRATUM

For Class 58—50 R see:
Patent No. 3,714,867

3,714,774

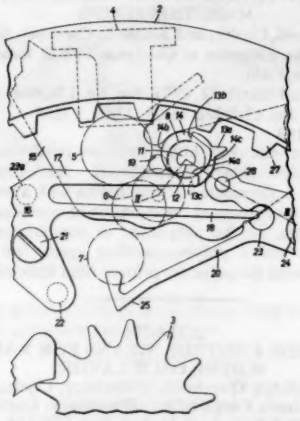
CORRECTION MECHANISM FOR CALENDAR WATCHES

Roland Zaugg, Grenchen, Werner Glanzmann, Bettlach, and Josef Fluck, Grenchen, Switzerland, assignors to A. Schild S.A., Grenchen (Canton of Sollure), Switzerland

Filed Dec. 13, 1971, Ser. No. 207,222
Claims priority, application Switzerland, Dec. 14, 1970, 18,490/70
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **9 Claims**

Apparatus is provided for manually correcting the date shown on a calendar watch by an indicating member exposed in an opening in the dial of the watch, the apparatus

comprising a correction member having a single rigid radial finger which when pivoted between two positions



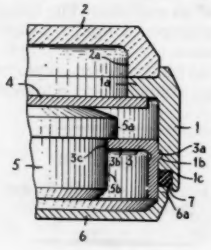
strikes a tooth of the indicating member and moves it one unit but upon the return pivot to the original position does not move the indicating member.

3,714,775

WATERPROOF WATCH WITH INTERLOCKING CRYSTAL SUPPORT RING AND MOVEMENT SUPPORT RING

Masayoshi Aoki, 8-4, 5-chome, Nishi-Koiwa, Edogawa-ku, Tokyo, Japan

Filed May 25, 1972, Ser. No. 256,686
Claims priority, application Japan, May 27, 1971, 46/43509
Int. Cl. G04b *37/08*
U.S. Cl. 58—90 R **5 Claims**



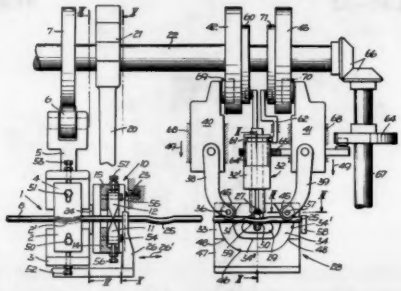
A watch and watch case construction which is dust-proof and moisture-proof. The watch case has an outer ring and an inner ring releasably joined together coaxially. The outer ring has an inner annular flange defining a seat on which the watch crystal rim is seated and a shoulder around this seat to hold the crystal from radial movement. The inner ring has an inner rim on which the watch movement is supported and fixed radially and axially of the inner ring. The two rings jointly define a groove, rectangular in cross section, into which a rim on the back cover extends and compresses a ring gasket, of circular cross section, to effect a moisture-proof and dust-proof seal.

3,714,776

APPARATUS FOR PRODUCING CHAIN LINKS

Gerhard Lange, Reutlingen, Germany, assignor to Wafios Maschinenfabrik Wagner, Ficker & Schmid G.m.b.H., Reutlingen, Germany

Filed May 28, 1971, Ser. No. 147,982
Claims priority, application Germany, June 9, 1970, P 20 28 266.0
Int. Cl. B21l *1/02*
U.S. Cl. 59—23 **12 Claims**



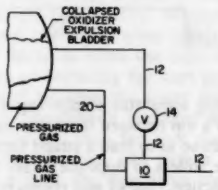
An apparatus for producing one-piece chain links in only two stations. The first of these stations contains a mechanism for severing a pin of a predetermined length from a rod or wire by means of two notching blades which reciprocate in opposite directions to each other within the same plane extending transverse to the axis of the rod. The first station further contains a press closely adjacent to and preceding the severing mechanism for clamping the rod in a fixed position during the severing operation and for bending at the same time the central part of the pin before being severed to provide the link when subsequently bent with a curved back. The second station contains a single bending unit in which the previously severed pin is bent in one continuous operation to its final shape by two bending rollers which roll the pin about a bending mandrel and are connected to guide rollers which roll along guideways so that the bending rollers themselves are indirectly guided and only have to engage with the pin during the bending operation. After a pin has been severed in the first station, it is passed by conveying tongs from this station to the bending unit and into the proper position therein for the bending operation.

3,714,777

PRESSURE DIFFERENTIAL LIMITER

De Lacy F. Ferris, Van Nuys, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 6, 1970, Ser. No. 56,021
Int. Cl. F02c *3/12*
U.S. Cl. 60—39.48 **4 Claims**



A normally open pressure differential actuated oxidizer flow control valve is located in a liquid propellant system

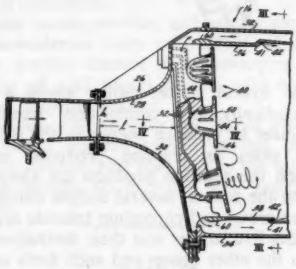
using a storage tank which employs a pressurized bladder to expell the oxident. This valve has an actuating piston responding to the increased expulsion gas-oxident pressure differential which occurs near completion of a missile firing. It is located in the oxidizer line and responds to such differential pressure increase to sever a shear disc and initially admit expulsion gas pressure to one side of the valve actuating piston. The other side is exposed to oxidizer pressure and, upon creation of sufficient pressure differential across the piston the valve closes to stop oxidizer flow.

3,714,778

ANNULAR COMBUSTOR SYSTEMS

Werner E. Howald, Cincinnati, Ohio, assignor to Angelica Corporation, St. Louis, Mo.

Filed Jan. 2, 1970, Ser. No. 353
Int. Cl. F02g 1/00
U.S. Cl. 60—39.74 R **6 Claims**



An annular combustor system is illustrated in a gas turbine engine environment. Compressor discharge air is diffused in a short length diffuser into a closely spaced plenum formed by a bluff bodied, annular array of fuel injectors and the upstream ends of liners which define, in part, an annular combustion zone. The compressor discharge air is evenly distributed in the plenum and then passes through and around the fuel injectors to break up the fuel and support its combustion in a short flame front having a uniform temperature distribution. Plenums surround the liners. Air from the diffuser pressurizes these plenums and is then metered by holes in the liners to provide cooling films on the inner surfaces thereof.

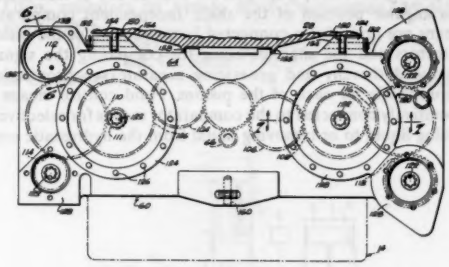
3,714,779

GAS TURBINE ENGINE HAVING A HORIZONTAL ACCESSORY GEAR BOX

Wolfgang J. Stein, Milford, Richard Ainsworth, Huntington, and Horst D. Berkner, Stratford, Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Sept. 28, 1970, Ser. No. 76,014
Int. Cl. F02c 7/20
U.S. Cl. 60—39.31 **12 Claims**

The disclosure illustrates a gas turbine engine providing a high degree of vertical accessibility to the engine and its important components. This accessibility is provided by employing a horiozntally positioned accessory gear box supported underneath the engine and having the accessories mounted on its upper surface. The gear box is supported from the engine housing so that the two components are free to thermally expand relative to one another. Vertically



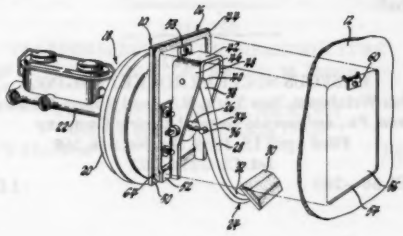
directed intake, exhaust and tangential single can combustor also contribute to the accessibility.

3,714,780

VEHICLE BRAKE CONTROL MODULE AND MOUNTING MEANS

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 30, 1971, Ser. No. 158,476
Int. Cl. F15b 7/00
U.S. Cl. 60—54.6 R **5 Claims**



A vehicle brake control module comprising a bracket to which the brake booster and master cylinder are mounted on one side and the brake pedal lever is pivotally mounted on the other side, the pedal lever being connected to operate the booster and master cylinder when the pedal is depressed. The module is adapted to be easily installed through an aperture in a suitable vehicle panel such as the firewall, the bracket closing and sealing the aperture.

3,714,781

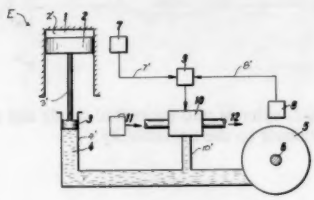
DEVICE FOR EXAMINING THE PISTON RINGS IN FREE-FLOATING PISTON ENGINES

Wolfgang Raetiger, Buchkenhofen, Germany, assignor to Grundig, Furth/Bay, Germany

Filed Dec. 8, 1971, Ser. No. 205,905
Claims priority, application Germany, Feb. 4, 1971, P 21 05 114.9
Int. Cl. F15b 7/00
U.S. Cl. 60—54.5 R **7 Claims**

A device is provided for use in examining the piston rings of free-floating piston engines wherein power from the pistons is transmitted to the engine's power output shaft through a hydrostatic motion converter system. The device includes piston detector means associated with each of the pistons in the engine for respectively producing a continuous output

signal corresponding to the momentary or instantaneous position of their associated piston. A shaft detector is located adjacent the engine's output shaft and is adapted to produce an output signal corresponding to the momentary or instantaneous angular position of the shaft. Independent comparator means are operatively connected between each of the piston detectors and the shaft detector for comparing the signals produced thereby and generating separate synchronization error signals for each of the pistons. Fluid control means is operatively connected to the comparator means for selectively adding liquid to or removing liquid from the hydrostatic con-



verter system in response to the synchronizing signal so that the synchronization error between the pistons and the shaft is reduced. An adjustable signal generator for selectively producing output signals corresponding to predetermined output shaft positions, is selectively connected to the comparator means by a switch so that when the signal generator is connected to the comparators, the latter generate predetermined synchronization error signals to operate the fluid control means and thereby move the pistons to predetermined positions independently of the actual position of the engine's output shaft.

3,714,782

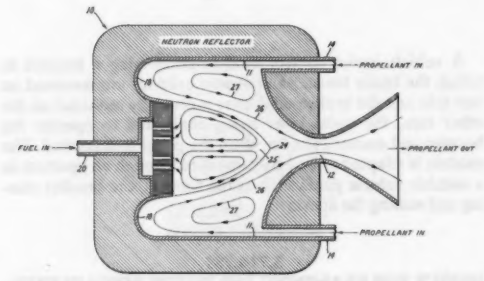
GASEOUS NUCLEAR ROCKET ENGINE

Sheldon Weinbaum, New York, N.Y., and Robert T. Liner, Jr., Devon, Pa., assignors to General Electric Company

Filed April 15, 1969, Ser. No. 816,269

Int. Cl. G21d *5/02*

U.S. Cl. 60—203 **1 Claim**



A gaseous nuclear propulsion engine wherein cool propellant gas is introduced around the nozzle at the aft end of the chamber and caused to flow along the chamber's outer wall to the chamber's fore end where it is deflected into a converging annular stream flowing toward the nozzle at the center of the chamber's aft end. Fissionable fuel gas is injected at the center of the fore end and is trapped in a closed space surrounded by the converging annularly flowing propellant gas. The fuel gas is maintained at a very high temperature by nuclear fission. Thermal radiation from the hot fuel gas is absorbed in the propellant gas as it flows toward the nozzle, thus heating the propellant to a high temperature before it exits through the nozzle.

3,714,783

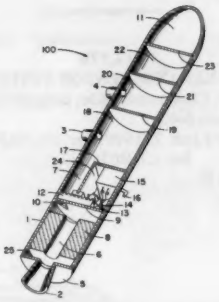
PROPULSION METHOD IN AN INVERSE HYBRID ROCKET MOTOR

Donald Perry Bennet, Jr., Arapahoe, Colo., assignor of a fractional part interest to Martin E. Gerry, Orange County, Calif.

Continuation-in-part of application Ser. No. 787,789, Dec. 30, 1968. This application Nov. 9, 1970, Ser. No. 87,958

Int. Cl. C06d *5/10*

U.S. Cl. 60—207 **9 Claims**



An inverse hybrid rocket motor where a fluid fuel reacts hypergolically in a combustion chamber with a nonfluid oxidizer to produce energy in the form of high temperature gases as reaction products, and means through which the reaction products are ejected to provide power to the rocket. Several unique oxidizers of the permanganate group and chromium trioxide are included. Fuels including hydrazenes and their derivatives, the carbonyl group, the ether group and such fuels as gasoline, diesel fuel and other petroleums and paraffin hydrocarbon derivatives are usable with these oxidizers to produce power.

3,714,784

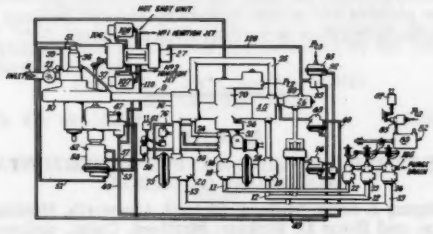
FUEL SUPPLY SYSTEMS FOR JET AIRCRAFT ENGINES

Stanley G. Glaze, Kingswinford, and Donald Craven, Wolverhampton, both of England, assignors to H. M. Hobson Limited, London, England

Filed Feb. 18, 1971, Ser. No. 116,413

Int. Cl. F02k *3/10*; **F02c** *9/04*

U.S. Cl. 60—241 **9 Claims**



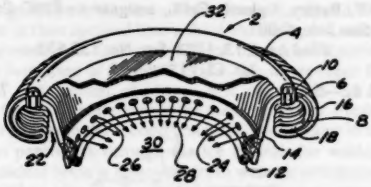
A reheat fuel control system for a jet aircraft engine, which comprises an engine-driven pump arranged to deliver fuel to primary, gutter and collander manifolds through individual primary,gutter and collander flow control valves, a three dimensional cam which is in joint control of the three control valves so as to maintain flows in the three manifolds which are desired functions of engine conditions, and means for controlling the metering pressure across the primary flow control valve as a function of engine speed.

3,714,785

ROCKET ENGINE NOZZLE WITH GAS SPIKE

Sam F. Iacobellis, Woodland Hills, Calif., assignor to North American Rockwell Corporation

Filed Feb. 11, 1966, Ser. No. 526,913
Int. Cl. F02k 9/02
U.S. Cl. 60—258 6 Claims



1. In a rocket engine having an annular combustion chamber, an injector and an annular throat, that improvement which comprises;

an annular nozzle portion, said nozzle portion extending downstream from said throat adjacent the interior portion thereof and converging toward the interior of said rocket engine, said nozzle portion having openings therein,

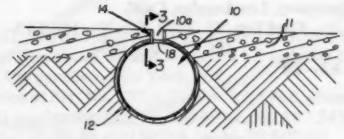
whereby gases exiting from said throat will impinge on said nozzle portion with a portion of said gases passing through said openings to the interior of said nozzle portion to increase base pressure on said engine.

3,714,786

DRAINAGE CULVERT

Ralph E. Evans, Middletown, Ohio, and Howard E. Blower, Lafayette, Calif., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 3, 1970, Ser. No. 60,516
Int. Cl. E02b 11/00
U.S. Cl. 61—11 10 Claims



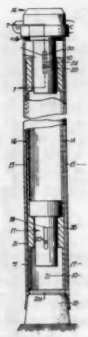
An open slot culvert for positioning in a drainage area with the open slot at the top so that any surface drainage water will flow through the slot and directly into the culvert, including a method and apparatus for its manufacture. The improved open slot culvert comprises a metallic, pipe section, split longitudinally along its upper side to form a narrow slot, and grate means, including two spaced, vertical bearing members joined by spacer means, secured in the slot. The method of making the improved open slot culvert includes the steps of providing two elongated, parallel, vertical members in spaced relation having a plurality of spacer means therebetween, longitudinally splitting the upper side of a metallic pipe section to form a narrow slot, and properly positioning the grate means within the narrow slot. The apparatus for making the improved open slot culvert generally comprises an entry pipe station, a pipe clamp, saw and tack welding station, and a finish welding and exit station.

3,714,787

ENERGY ABSORBING DEVICE FOR THE CONNECTIONS OF A SEGMENTED DRIVE CORE

William C. Clements and William Bootz, Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed May 3, 1971, Ser. No. 139,365
Int. Cl. E02d 7/30, 5/34
U.S. Cl. 61—53.7 10 Claims



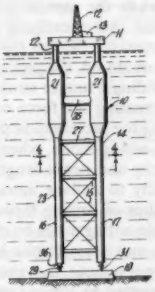
An energy absorbing device for the connections of a segmented drive core to decelerate each lower segment by absorbing the drive core inertia and downward momentum of such lower segments.

3,714,788

PLATFORM BUOYANT UNDERSTRUCTURE

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed April 30, 1970, Ser. No. 33,407
Int. Cl. B63b 21/50; E02b 17/00
U.S. Cl. 61—46.5 1 Claim

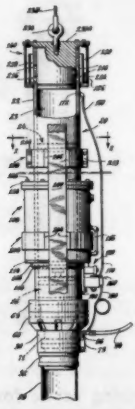


The invention relates to a floatable understructure for a marine platform or deck located in an offshore body of water. The understructure includes an elongated rigid column unit incorporating buoyancy means so disposed to permit the attitude of the structure to be controlled. In the operating position, one end of the understructure is operably connected to an anchor resting on the ocean floor. The structure other end is buoyed up such that the unit assumes a generally upright disposition in the body of water with a portion protruding beyond the water's surface to support the working deck or platform.

3,714,789
AUTOMATICALLY SELF-REGULATING VARIABLE-STROKE, VARIABLE-RATE AND QUIET-OPERATING PILE DRIVER METHOD AND SYSTEM

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Dec. 29, 1970, Ser. No. 102,325
Int. Cl. E02d 7/02
U.S. Cl. 61—53.5 17 Claims

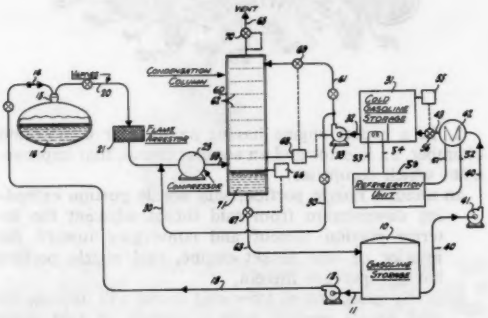


Automatically self-regulating variable-stroke, variable-rate and quiet-operating pile driver method and system are disclosed in which a massive piston weight is bounced upon a cushion of pressure fluid, the pile driver advantageously being adapted for operation in four different modes: (1) only double-acting, (2) single-acting automatically converting to double-acting at maximum stroke travel, (3) only single-acting, (4) pre-stressing plus impacting plus thrusting mode, and (5) pile extraction mode. The prolonged downward push resulting from the pressurized fluid-cushioned bouncing action is more effective than the conventional sharp hammer-type blow resulting from impact of one solid mass against another. When the pile being driven encounters softer strata in the earth, in the single-acting mode, the stroke of the piston weight automatically shortens while the number of bounces per minute automatically increase thus increasing the rate of the quiet powerful bounce thrusts for driving the pile faster, and when harder strata are encountered, the piston weight automatically bounces higher providing a longer stroke with fewer bounces per minute, thus increasing the force of each quiet powerful thrust for overcoming the increased impedance being encountered. In the double-acting mode, when harder strata are encountered, the velocity and stroke length of the piston weight increase automatically to deliver more powerful thrusts. A relatively large number of driving thrusts per minute can be provided in the double-acting mode by changing the head plug mass to shorten the maximum stroke length to increase the frequency of thrusts per minute. By virtue of the pressure fluid bouncing action imparted to the massive piston weight, the noise of metal-to-metal contact blows can be avoided, and in addition a muffler housing surrounding the ports through which the expanded pressure fluid is released muffles the sound of the flow of the fluid, such as air or steam; this muffler also serving to separate lubricating oil from the released fluid. A cylinder bottom assembly below the bounce chamber is coupled to the pile being driven to transmit the quiet powerful bounce thrusts to the pile, moving in accordance with the pile motion, and a driving fluid storage chamber and valve mechanism associated with this assembly control the flow of the pressure fluid in an automatically self-regulating manner to seek the most effective driving action from moment-to-moment as the pile encounters different strata. If desired, the bouncing action of the cushion of pressure fluid can be altered to permit the piston weight to strike bottom slightly to provide the driving mode (4) above. A self-contained lubrication system may be actuated by the pressure impulses in the bounce chamber.

3,714,790
APPARATUS AND METHOD FOR HANDLING VOLATILE LIQUIDS

Robert F. Battey, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed April 13, 1971, Ser. No. 133,638
Int. Cl. F17c 13/00
U.S. Cl. 62—54 7 Claims

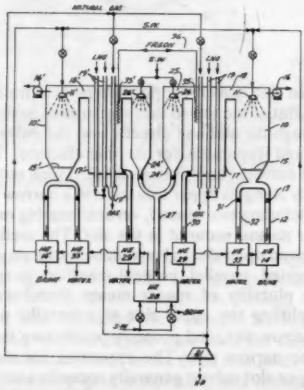


Hydrocarbon vapors normally released to the atmosphere during the filling of tanks with a relatively volatile liquid are condensed out and recovered as liquid by simultaneously compressing the vapors and saturating the same with vapors of the liquid, followed by a step wherein the compressor effluent is contacted under elevated pressures in a condensation column with a refrigerated stream of the volatile liquid. Said stream is supplied from a relatively small holding tank which is refrigerated and maintained at a relatively constant volume by addition of fresh quantities of the liquid as required.

3,714,791
VAPOR FREEZING TYPE DESALINATION METHOD AND APPARATUS

Ralph E. Peck, Chicago, Ill., assignor to Pacific Lighting Service Company, Los Angeles, Calif.

Filed Feb. 25, 1971, Ser. No. 118,669
Int. Cl. B01d 9/04
U.S. Cl. 62—58 13 Claims



A batch evaporative desalination method and apparatus having a pair of similar systems for substantially continuous

output is described. Each system has three evacuated chambers in vapor communication with each other. In the first chamber, precooled seawater is sprayed for partial vaporization and consequent formation of ice crystals as latent heat is removed from the seawater. Ice crystals are permitted to accumulate in the first chamber and water vapor flows to a second chamber in which refrigeration coils, preferably cooled by cold natural gas, are maintained at a temperature below the triple point so that ice condenses thereon. After a selected interval, spraying of precooled seawater into the first chamber and refrigeration in the second chamber are stopped. Warmer seawater is then sprayed into a third chamber also maintained at low pressure so that a portion of the water vaporizes but without formation of ice in the brine. The water vapor flows to the first and second chambers and condenses on the ice therein to transfer latent heat for melting the ice. Fresh water is withdrawn from the second chamber. Fresh water in the first chamber percolates through the ice crystals for washing and when residual brine is removed, fresh water is withdrawn from this chamber also. In a preferred embodiment, natural gas refrigerant is expanded through a turbine for producing shaft horsepower for pumping seawater. The apparatus is arranged with hydraulic legs beneath the first and third chambers at a height at least equal to the head of water at one atmosphere pressure for maintaining low pressure in the three chambers. In a preferred arrangement, a reversible refrigeration loop may be provided between a pair of second chambers for reversibly transferring heat therebetween.

3,714,792

FREEZING AND MELTING TREATMENT OF RED MUD SLURRIES TO AID SOLID SEPARATION

James M. Murphy, Oakland, and Perce W. Bolmer, Danville, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 19, 1971, Ser. No. 173,226
Int. Cl. B01j *13/00*; B01d *9/02*
U.S. Cl. 62—58 **10 Claims**

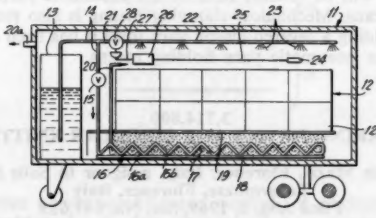
Red mud slurries, resulting from the alkaline digestion of bauxite and consisting of finely divided red mud particles dispersed in an aqueous medium, are subjected to a freeze-thaw treatment to enhance the settling properties and the filterability of the dispersed particles. Lowering the temperature of the slurry to a temperature required to freeze at least a portion of the aqueous medium, followed by thawing, was found to impart significantly accelerated settling and filtration rates.

3,714,793

INTRANSIT LIQUEFIED GAS REFRIGERATION SYSTEM

Lester Hurt Eigenbrod, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 777,643, Nov. 21, 1968, abandoned. This application Jan. 18, 1971, Ser. No. 107,541
Int. Cl. B60h *3/04*; F25b *19/00*; F17c *7/02*
U.S. Cl. 62—62 **16 Claims**



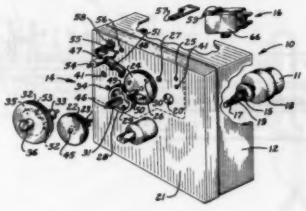
A liquefied gas vaporizer is provided in the bottom portion of the freeze-sensitive product storage chamber with thermal insulation around the liquid vaporizing conduit and thermally conductive metal floor means contiguously associated with and in heat transfer relation to the thermal insulation.

3,714,794

DRIVE MOTOR-DEFROST TIMER FOR REFRIGERATOR

William J. Linstromberg and Duane C. Nichols, Evansville, Ind., assignors to Whirlpool Corporation

Continuation of abandoned application Ser. No. 46,921, June 17, 1970. This application Feb. 4, 1972, Ser. No. 223,716
Int. Cl. F25c *1/10*
U.S. Cl. 62—137 **14 Claims**



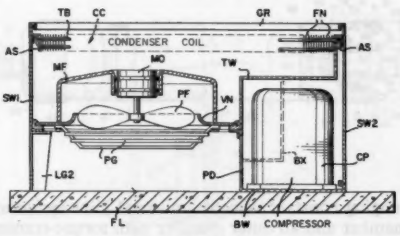
A timer for controlling the defrost operation of a refrigeration apparatus. The refrigeration apparatus includes an ice body maker having a drive motor. The ice maker drive motor is utilized also to drive the defrost timer. The control permits the ice maker motor to operate continuously while discontinuing ice body production such as when the ice harvesting container is full.

3,714,795

OUTDOOR REFRIGERANT APPARATUS

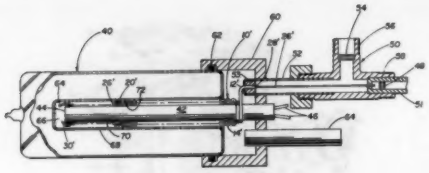
Andrew J. Fowell, Martinsville, N.J., and George R. Knebusch, North Olmsted, Ohio, assignors to The Tappan Company, Mansfield, Ohio

Filed March 31, 1970, Ser. No. 24,245
Int. Cl. F25b *39/04*
U.S. Cl. 62—508 **15 Claims**



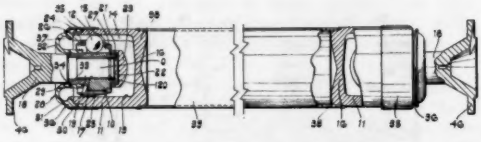
Covers an outdoor refrigerant condenser-compressor unit operating at a low noise level. The unit consists of an upright housing in which a motor-driven fan having its blades in a relatively horizontal position transmits air under pressure directed upwardly, and a tubular condenser coil is mounted above the blades of the fan so that the air delivered by the fan will flow through the coil and cool and condense the hot refrigerant vapor supplied by the compressor as part of a cooling system. The compressor may be physically positioned adjacent to the fan within the same general housing, but the compressor may occupy a separate ventilated space adjacent to the fan structure. The condenser coil is arranged to substantially occupy the whole top space of the housing unit, or most of that space, in any case positioned well above the blades of the fan. The fan is thus concealed and inaccessible to fingers, pebbles and other impediments. The fan is operated at increased efficiency because relatively cool air is delivered thereto from the ground level.

3,714,796
CRYOGENIC REFRIGERATION SYSTEM WITH DUAL CIRCUIT HEAT EXCHANGER
Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Filed July 30, 1970, Ser. No. 59,478
Int. Cl. F25b *19/00*
U.S. Cl. 62—514 **3 Claims**



Disclosed is a miniature cryogenic refrigeration system employing a dual circuit heat exchanger to effect rapid cooldown of the system. The heat exchanger is characterized in that the cooldown circuit is disposed within the run or steady state circuit with both circuits employing the same high pressure gas as the refrigerant.

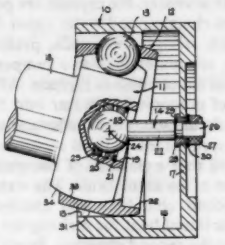
3,714,797
UNIVERSAL JOINTS
Leslie George Fisher, Birmingham, England, assignor to GKN Birfield Transmissions Limited, Birmingham, England
Filed Dec. 11, 1970, Ser. No. 97,381
Claims priority, application Great Britain, Dec. 11, 1969, 60,435/69, 60,436/69
Int. Cl. F16d *3/16*
U.S. Cl. 64—8 **11 Claims**



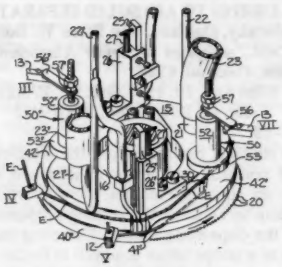
A plunging constant velocity universal joint includes an inner member and an outer member with torque-transmitting balls therebetween and sealing means acts between the inner and outer members of the joint such that a lubricant-tight enclosure is defined around the balls and the sealing means includes a part which acts as a stop to limit plunging movement in one direction.

3,714,798
CONSTANT VELOCITY UNIVERSAL JOINTS
Jerzy Witold Macielinski, Warwick, England, assignor to GKN Birfield Transmissions Limited, Birmingham, England
Filed Feb. 17, 1971, Ser. No. 115,980
Claims priority, application Great Britain, Feb. 28, 1970, 9,763/70
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **5 Claims**

A constant velocity universal joint includes a restraining means in the form of a ball and socket connection between the inner member and the outer member of the joint. The inner member of the joint is free to move angularly relative to the outer member but is fixed against relative axial movement by said ball and socket connection.



3,714,799
YARN CONTROL APPARATUS AND METHOD FOR CIRCULAR HOSIERY KNITTING MACHINES
Clarence W. Minton, Nashville, Tenn., assignor to Americal Corporation, Henderson, N.C.
Filed Dec. 28, 1970, Ser. No. 101,484
Int. Cl. D04b *15/61*
U.S. Cl. 66—140 S **4 Claims**

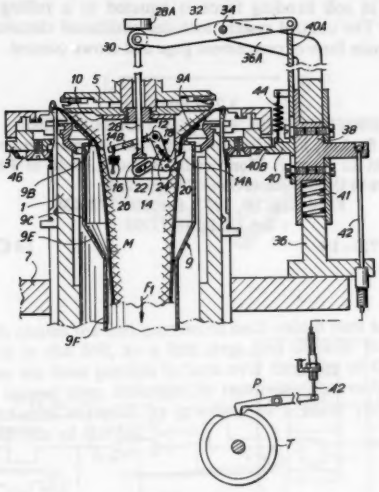


The present yarn control apparatus is adapted for use with circular multi-feed hosiery knitting machines of the type having a pair of diametrically opposed yarn cutters and pneumatic yarn holding means associated with each cutter. The control apparatus acts on a yarn withdrawn from active position at a yarn feeding station in advance of one of the cutters for preventing engagement of this yarn with this cutter and for directing the yarn into engagement with the next cutter so that the free leading end of the yarn severed by the second cutter has sufficient length that it will be reliably held by the pneumatic yarn holding means. Mechanical clamping means is also provided for holding a severed elastic yarn until it has been drawn into the pneumatic yarn holding means.

3,714,800
SHEARING DEVICE FOR CIRCULAR KNITTING MACHINES
Aramis Mazzi, Florence, Italy, assignor to Solis S.r.l., Tavarmuzze, Florence, Italy
Filed Aug. 5, 1969, Ser. No. 847,615
Claims priority, application Italy, Aug. 14, 1968, 841,972/68
Int. Cl. D04b *35/00*
U.S. Cl. 66—147 **6 Claims**

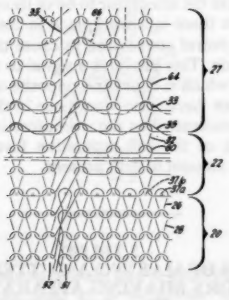
To produce a longitudinal cut in knit fabric during the knitting thereof on a circular knitting machine, a

shearing device in the form of scissors or an electrical resistance is disposed within the needle cylinder of the



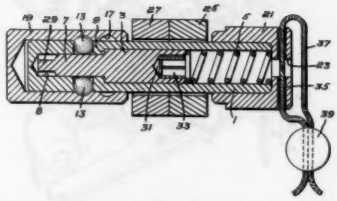
machine. The shearing device is movable between an operative position in which the fabric is cut and an inoperative position.

3,714,801
STOCKING AND METHOD OF MAKING SAME
Richard M. Janda, Crestwood, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Nov. 29, 1968, Ser. No. 779,733
Int. Cl. D04b 9/56
U.S. Cl. 66—170 **8 Claims**



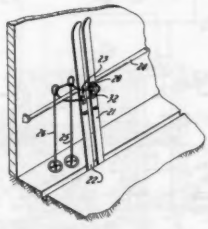
Knitted tubular stocking and methods of fabricating the same, said stocking having welt, leg and foot portions and a tubular double ply toe portion with a draw yarn interlaced with the stitches of courses defining the outer end of the double ply toe portion, the draw yarn acting when partially withdrawn from the courses to gather the stitches thereof into a tight bunch to close the outer end of the toe.

3,714,802
LOCKING BOLTS FOR SHUT-OFF VALVES AND SWITCHES
Lynn H. Morse, P.O. Box 1505, Venice, Fla. 33595, and Anker J. Nielsen, Jr., 410 Bailey Road, Holden, Mass. 01520
Filed May 12, 1971, Ser. No. 142,462
Int. Cl. E05b 67/36
U.S. Cl. 70—34 **7 Claims**



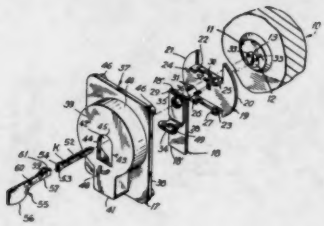
In a locking bolt for shut-off valves, switches, meters, and other supply-controlling devices, such bolt being actuated by an inner spring-biased plunger having an axial recess and accessible only through an aperture in the bolt smaller than the diameter of the recess, the novel provision of a slidable sleeve or liner in such recess which must be expanded into tight frictional engagement with the walls of the recess in order to retract the plunger to unlock the bolt. Sealing means preventing access to the interior of the locking bolt without rupture is provided. The lock is also adapted to fix a cover on a meter casing or other enclosure, to prevent unauthorized access thereto; or to prevent removal of the meter itself.

3,714,803
SKI LOCK
Norman Chenenko, 3911 Greentree Drive, Oceanside, N.Y.
Filed Nov. 27, 1970, Ser. No. 93,220
Int. Cl. E05b 73/00
U.S. Cl. 70—58 **1 Claim**



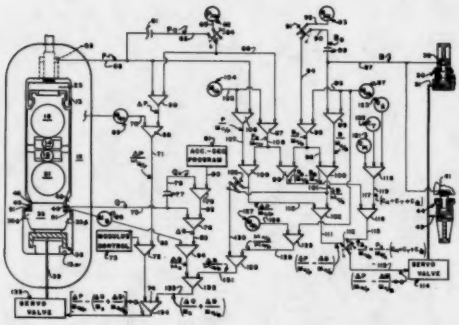
A ski lock adapted to be mounted on one of a pair of skis and being normally in the unlocked position and adapted to be altered to a locked condition whereby the pair of skis is affixed to a support. Retractable means are mounted in a housing and are adapted to be partially extended through an opening in the housing. A two-piece fastener is provided with one part of the fastener on the exterior of the housing and the other part of the fastener connected to the retractable means. There are means in the housing to facilitate the extension and retraction of the retractable means which is attachable to the support and the other ski with the two-part fastener in locked engagement thereby locking the skis to the support to minimize the danger of the skis being stolen until it is desirable to utilize the skis whereupon the parts of the fastener are unlocked and disengaged.

3,714,804
SHUTTER STRUCTURE
Walter K. French, Montrose, N.Y., assignor to Richard William Cameron, New York, N.Y.
Filed Nov. 4, 1971, Ser. No. 195,606
Int. Cl. E05b *17/14, 19/00*
U.S. Cl. 70—419 **9 Claims**



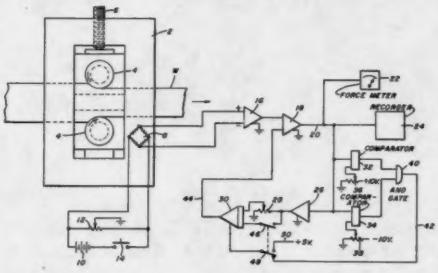
Apparatus for increasing the security of existing door lock installations by rendering the same impervious to picking. The apparatus includes an armored cover plate and shutter mechanism adapted to prevent the effective application of picking torques to the lock plug, and includes novel key means and an operator thereon, and an auxiliary locking provision which bars operation of the lock even by persons having a properly fitting key.

3,714,805
CONTROL SYSTEM AND METHOD FOR CONCURRENT AUTOMATIC GAGE AND CROWN CONTROL OF A ROLLING MILL
Morris Denor Stone, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.
Filed Nov. 11, 1971, Ser. No. 197,715
Int. Cl. B21b *37/08*
U.S. Cl. 72—8 **20 Claims**



A control system and method for concurrently controlling the delivery gage and crown of a workpiece while it is being processed in a rolling mill, preferably in the form of a 4-high rolling mill including a piston and cylinder assembly type of force applicator for adjusting the gap formed between the working rolls under the rolling load. The rolling mill further includes roll bending apparatus whereby bending forces are applied to extended journals of the backup rolls for changing the effective roll crown at the roll gap. The control system provides an automatic control designed to concurrently maintain a relationship between signals generated on the basis of rolling mill measurements to control the force applicator and the roll bending device. This concurrent relationship of signals equates a position change of the force applicator with the algebraic sum of signals representing roll gap changes due to a change in the rolling load and due to a change in the roll bending force, while concurrently the change in roll crown due to a change in roll bending force is equated to a rolling load change. The control system includes additional circuitry for an alternate form of concurrent gage and crown control.

3,714,806
DRIFT CORRECTOR FOR TRANSDUCERS
Earl R. Berkey, Franklin Twsp., Westmoreland County, and Everett L. Keener, Monroeville Borough, both of Pa., assignors to United States Steel Corporation
Filed Aug. 20, 1971, Ser. No. 173,436
Int. Cl. B21b *37/08*
U.S. Cl. 72—19 **14 Claims**

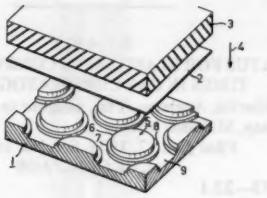


Apparatus for measuring the roll separating force produced by a workpiece includes a strain gage bridge, and an amplifier having a first input connected to the output of the bridge, a second input and an output. A first circuit including a polarity reversal means and an integrator connected in series is arranged between the output and second input of the amplifier. The integrator has an input connected to the output of the amplifier, an output connected to the second input of the amplifier, and a control connection. A second circuit between the control connection and the first circuit on the input side of the integrator includes switch means operable when there is no workpiece in the mill to provide a signal to the control connection to cause the integrator to be in its operative mode and operable when there is a workpiece in the mill to provide a signal to the control connection to cause the integrator to be in its hold mode. This provides a signal to the amplifier from the integrator which is equal and opposite to the voltage from the bridge when there is no workpiece in the mill which voltage remains constant when the workpiece is in the mill. Thus, a true reading of the roll separation force is obtained regardless of the amount of drift present.

3,714,807
PROCESS OF MAKING A CUTTER FOIL FOR DRY SHAVING APPARATUS
Sigrot Grunberger, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 23, 1970, Ser. No. 74,632
Claims priority, application Austria, Sept. 25, 1969, A 9,089/69
Int. Cl. B21d *28/18*
U.S. Cl. 72—55 **8 Claims**

A process of making a cutter foil for dry shaving apparatus, using a rubber cushion, and a die having raised parts each of which decreases in cross section from a base

to a free end, and consists of two superimposed portions between which is a step-like offset, the end portion having a height at least equal to the thickness of the foil; the process comprising a single operation of pressing the die and the cushion together with the foil between them,



which causes the end portion of each raised part to punch a hole in the foil, as a first step, and directly thereafter causes the base portion to turn over the edge of the hole, as a second step; followed by removing part only of the turned-over material by grinding in a plane parallel to the surface of the foil.

3,714,808

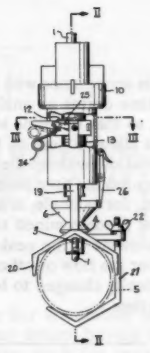
MEANS FOR FORMING A HOLE IN A TUBE OR PIPE WALL AND DEFORMING THE EDGE OF THE HOLE INTO AN UPSTANDING FLANGE

Leo Larikka, IV Linja 17–19 B 3, Helsinki, Finland

Continuation-in-part of application Ser. No. 744,087, July 11, 1968, now Patent No. 3,592,038. This application Mar. 17, 1971, Ser. No. 125,035

Int. Cl. B21d *31/02, 53/00*

U.S. Cl. 72—325 **5 Claims**



A tool for forming a hole and a surrounding upstanding flange for the wall of a tube into which flange a branch pipe is adapted to be attached in which a drill is provided with at least two components which, after drilling of the hole, can be extended under the edge of the hole whereby, upon withdrawal of the drill, the components form a projecting flange at the edge of the hole. For forming the flange and particularly for returning the drill, means are employed to obtain an appropriate number of revolutions and return feeding as well as a support for the work piece or the tube.

3,714,809

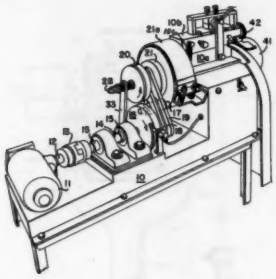
ROTARY STAMPING MACHINE

Tony E. Lewis, Campbell, Calif., and George Rodriguez, 1292 McBair Ave., Campbell, Calif. 95008; said Lewis assignor to said Rodriguez

Filed Jan. 14, 1971, Ser. No. 106,447

Int. Cl. B21d *31/02*; B21j *13/10*

U.S. Cl. 72—326 **5 Claims**



A rotary stamping machine for cutting tongues in sheet metal and bending the tongues to extend at an angle to the sheet metal body. The sheet metal is clamped between rotatable driving means and is advanced step by step, after the sheet metal is advanced a step it is stationary during the tongue cutting interval. After the tongue is cut and bent the cutting means is shifted to clear the sheet metal and the sheet metal is advanced another step. Thereafter the cutting and bending operations are repeated.

3,714,810

BLIND RIVET PULLING TOOL

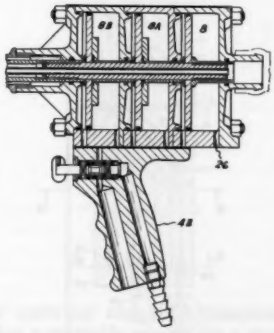
Clive Reginald Boyd, Artarmon, New South Wales, Australia, assignor to Spurway's Industries Pty. Limited, Alexandria, New South Wales, Australia

Filed Dec. 3, 1970, Ser. No. 94,796

Claims priority, application Australia, Dec. 23, 1969, 65680

Int. Cl. B21j *15/20*

U.S. Cl. 72—391 **1 Claim**

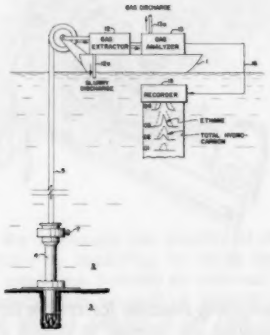


An improved fluid operated rivet pulling tool for forming a head on the far side of the work. The tool is adaptable to use on a variety of rivet sizes with minor addition or interchange of parts such as an additional piston and associated cylinder block with ports.

3,714,811
MARINE MUD HYDROCARBON SURVEYING

Edwin E. Daigle; Robert R. Luke; James B. Turner, and Harold L. Wise, all of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 22, 1970, Ser. No. 48,366
Int. Cl. G01n 7/00
U.S. Cl. 73—19 8 Claims

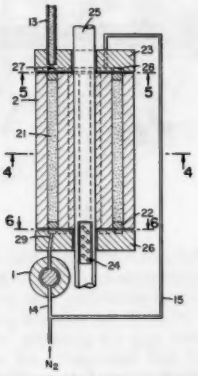


A process for exploring a water-covered region is improved by jetting water into soft bottom sediments, forming a slurry of the sediments in water, extracting gas from the slurry and measuring the concentration with location of a mobile reservoir fluid that was entrapped within the bottom sediments.

3,714,812
ELECTRON CAPTURE IDENTIFICATION APPARATUS

John W. Drinkwater, Chester, and Albert Evans, Wirral, both of England, assignors to Shell Oil Company, New York, N.Y.

Filed May 22, 1970, Ser. No. 39,602
Claims priority, application Great Britain, May 22, 1969, 26,209/69
Int. Cl. G01n 31/08
U.S. Cl. 73—23.1 3 Claims

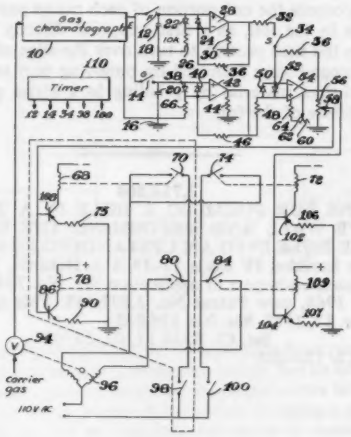


An electron capture identification apparatus for identifying labelling additives which comprises a revolving gas/liquid chromatographic tube magazine for receiving samples from the sampling mechanism and an electron capture detector for detecting a labelling additive separated in the magazine. The eluents of the individual tubes of the magazine are mixed in an after-column whose eluent is supplied to the detector so as to provide a constant background indication and to compensate for minor variations between individual tubes of the magazine.

3,714,813
APPARATUS FOR STABILIZING COMPONENT ELUTION TIMES IN GAS CHROMATOGRAPHS

Fred D. Martin, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 12, 1971, Ser. No. 105,893
Int. Cl. G01n 31/08
U.S. Cl. 73—23.1 3 Claims



A peak stabilizer in accordance with this invention controls the peak retention time during an analysis, by gas chromatograph, for example, so that this time will be the same for all determinations. This allows a peak to be gated or picked for process control or read-out without the undesirable possibility that it would drift beyond the time limits of the gate. If a peak in the chromatogram, for example, is sampled on the leading and trailing slopes at predetermined times, a comparison of these voltages will indicate if the peak is early, late or at its right time. The carrier gas flow or other rate control parameter may be automatically changed to bring the peak back to the proper retention time.

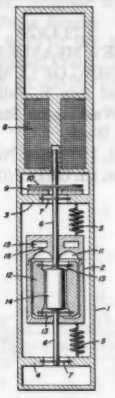
3,714,814
TIGHT VISCOSIMETER WORKING IN AGGRESSIVE MEDIA

Albert M. Schneiders, Angera; Peter Schiller, Gavirate; Gustave L. Hollebeck, Ispra, and Friedhelm Diletti, Gemonio, all of Italy, assignors to European Atomic Energy Community (Euratom), Kirchberg, Luxembourg

Filed April 23, 1970, Ser. No. 31,346
Claims priority, application Luxembourg, April 29, 1969, 58532
Int. Cl. G01n 11/16
U.S. Cl. 73—54 11 Claims

A viscosimeter for measuring the viscosity of fluids or suspensions especially those which may be inherently dan-

gerous such as radioactive fluids. The fluid is placed in a sealed casing with a cylindrical body inside. The casing is resiliently suspended for axial oscillation in a sheath which can

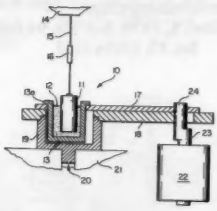


be evacuated. Means such as a solenoid are provided to oscillate the casing. Means outside the sealed area to measure the damping of the oscillations of the cylindrical body are also provided.

3,714,815
MEANS FOR SIMULATING THE NATURAL FLOW OF BLOOD

Hellmut Hartert, Kaiserslautern, Germany, assignor to Fritz Hellige & Co. G.m.b.H., Freiburg im Breisgau, Germany

Filed Apr. 15, 1971, Ser. No. 134,143
Claims priority, application Germany, Apr. 22, 1970, P 20 19 341.3
Int. Cl. G01n *11/10, 33/16*
U.S. Cl. 73—64.1 **4 Claims**

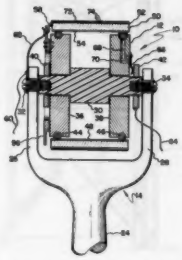


Mechanical means for simulating the natural flow of blood, including motor means having an eccentrically located cam on its drive shaft for providing motion to a crank lever having a movable pivot point. A vessel containing a blood sample under analysis is retained on the crank lever to receive the motion established by the mechanical means. The vessel containing the blood sample is orbited around a detector element at a relatively high speed to establish shearing effects and resulting electro-kinetic surface effects between the inner wall of the vessel and the surface of the detector element corresponding to the shearing and electro-kinetic surface forces present in the veins and arteries of an individual. The detector element is part of a conventional blood analysis device which may provide either visual or recorded indicia representative of the coagulation characteristics of the blood sample.

3,714,816
TUBULAR TRANSDUCER AND DRY COUPLANT THEREFOR

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation

Division of Ser. No. 832,568, June 12, 1969, Pat. No. 3,678,737. This application April 30, 1971, Ser. No. 139,116
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.5 **5 Claims**

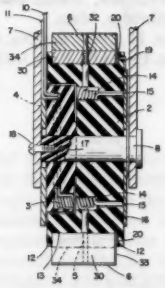


A probe for nondestructive testing to identify internal structural defects comprises a tubular piezoelectric element adapted for low frequency vibration while moving in rolling contact over a workpiece surface. A dry adhesive couplant forms a mechanical bond between the piezoelectric element and the workpiece surface, and is also useful with disc-type probes known to the prior art, especially when the adhesive is coated with a layer of minute glass beads.

3,714,817
ACOUSTICAL TRANSDUCER WITH ROTARY PULSE COUPLER

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation

Filed Sept. 28, 1970, Ser. No. 75,997
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.5 **2 Claims**

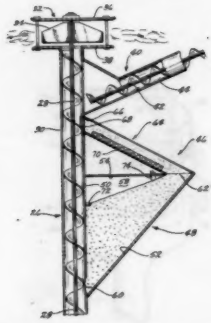


A manual probe for ultrasonic inspection of metallic workpieces has a rotatable wheel with a plurality of separate transducer crystals affixed thereon concentric about the rotation axis. The crystals are individually connected to separate secondary transformer coils mounted within the wheel. A stationary primary coil is mounted adjacent the rotatable wheel and adapted to excite each secondary coil in succession as the crystal connected to such coil contacts the workpiece surface during wheel rotation, whereby only one crystal is excited at any given instant.

3,714,818
METHOD AND MEANS OF MEASURING THE MOISTURE CONTENT OF GRAIN

Warren L. Relph, Cambria, Iowa

Filed March 10, 1971, Ser. No. 122,743
Int. Cl. G01n *33/02*
U.S. Cl. 73—73 12 Claims



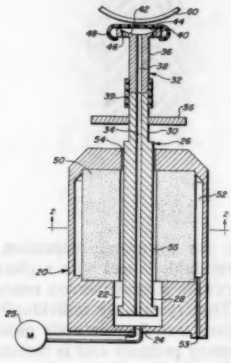
A method for determining the moisture content of grain is comprised of the steps of depositing a quantity of grain to be tested at a fixed point above a supporting surface so that the grain will, through gravity, form a uniformly inclined surface extending outwardly and downwardly from the point of deposit, and measuring the magnitude of the angle created between the surface of the grain and a horizontal plane.

The means for measuring the moisture content of grain includes a triangular box having an opening at its upper end and an opening at its lower end. The moisture content of the grain is determined by measuring the slope of the pile of grain which accumulates in the box as the grain is poured into the box.

3,714,819
APPLANATION TONOMETER COMPRISING POROUS AIR BEARING SUPPORT FOR APPLANATING PISTON

Robert H. Webb, Lexington, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Nov. 19, 1970, Ser. No. 90,893
Int. Cl. A61b *3/16, 5/02*
U.S. Cl. 73—80 2 Claims

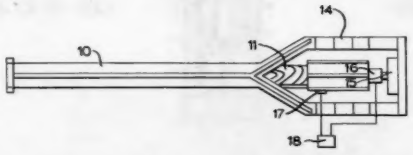


An applanation tonometer using a pneumatically driven piston having a sensing tip operated by the gas driving the piston, in which a porous gas bearing serves both as a bearing for the piston and a throttling barrier for gas introduced to drive the piston.

3,714,820
COMBINED TENSILE E MEASUREMENT AND PROOF LOADING OF LUMBER

Melvin D. Strickler, and Roy F. Pellerin, both of Pullman, Wash., assignors to Washington State University Research Foundation, Pullman, Wash.

Filed Oct. 1, 1971, Ser. No. 185,537
Int. Cl. G01n *3/08*
U.S. Cl. 73—89 17 Claims

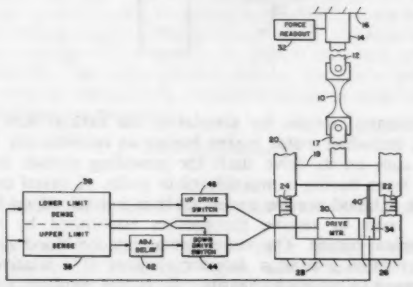


A method and apparatus for stress grading structural wood members in a non-destructive test by which each member is proof loaded in tension parallel to the grain at a stress level approaching the predicted rupture strength of the particular member. The modulus of elasticity of each member is measured at low stress during the early stages of the loading cycle. The proof load level for each member is determined in relation to its measured modulus of elasticity.

3,714,821
MATERIAL FATIGUE TESTING SYSTEM

Paul J. Gilley, Decatur, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics Space Administration

Filed Dec. 1, 1970, Ser. No. 94,049
Int. Cl. G01n *3/32*
U.S. Cl. 73—90 1 Claim



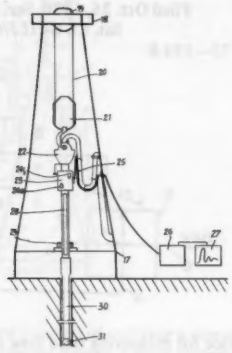
A system for cyclicly applying a varying load to a material under test. It includes a load sensor which senses the magnitude of load being applied to a material, and, upon sensing a selected magnitude of loading, causes the load to be maintained for a pre-determined time and then causes the system to resume cyclical loading.

3,714,822

PROCESS FOR MEASURING WEAR ON A DRILLING TOOL

Jean Lutz, Pau, France, assignor to Societe Nationale des Petroles d'Aquitaire, Paris, France

Filed Nov. 9, 1970, Ser. No. 87,700
Claims priority, application France, Nov. 12, 1969, 6938645
Int. Cl. G01n *29/00*
U.S. Cl. 73—104 9 Claims



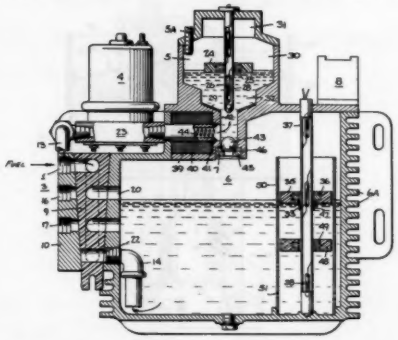
The wear on a drilling tool is measured by picking up certain vibrations produced by rotating said tool, which vibrations have a component indicative of the extent to which the tool has worn. The indicative component may be at least partially isolated so as to produce a more exact result.

3,714,823

FUEL CONSUMPTION METER

Henry W. Wilkens, and Daniel D. Sabatino, both of Little Ferry, N.J., assignors to Flowtron Industries Inc., Little Ferry, N.J.

Filed Sept. 11, 1970, Ser. No. 71,289
Int. Cl. G01f *3/36*
U.S. Cl. 73—113 12 Claims



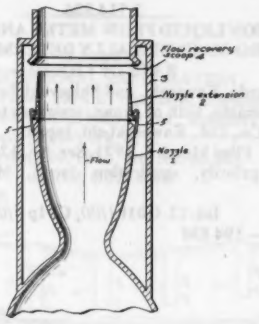
A fuel meter for trucks having a fuel measuring chamber for measuring by float sensed levels a quantity of fuel and emptying that quantity into a reservoir from which the truck engine draws its fuel, the emptying occurring whenever the fuel level in the reservoir is low. A counter counts the number of times the measuring chamber thus empties in order to compute overall fuel consumption. The meter can be by-passed when out of order.

3,714,824

APPARATUS FOR MEASURING SKIN FRICTION

Clarence C. Bush, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 21, 1970, Ser. No. 100,018
Int. Cl. G01m *17/00*
U.S. Cl. 73—117.4 6 Claims



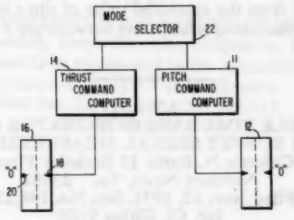
A ring shaped element is placed in the path of flowing fluid. Gravity holds the element down until skin frictional forces of the flowing fluid lift it off its seat. At the point of lift-off the precise degree of skin friction is known.

3,714,825

INSTRUMENT FLIGHT SYSTEM

William W. Melvin, 8424 Greenstone Drive, Dallas, Tex.

Division of Ser. No. 813,500, April 4, 1969, Pat. No. 3,586,268. This application Dec. 29, 1970, Ser. No. 102,298
Int. Cl. G01c *21/00*
U.S. Cl. 73—178 T 2 Claims



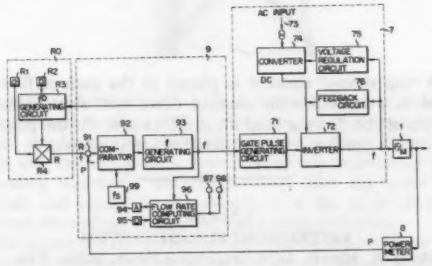
An aircraft control system particularly useful during approach operations. In the approach mode, a pitch command computer produces a pitch command signal for controlling an aircraft's pitch to maintain a desired angle of attack, and hence a desired airspeed; and a thrust command computer produces a thrust command signal for controlling the flight path angle to maintain an aircraft on a desired glide path for landing. The command signals control either instrument indicators which visually display the appropriate information to the pilot for manual operation or alternatively control an autopilot and autothrottle for automatic operation of the aircraft. If the aircraft is below the desired glide path but at the desired airspeed, a thrust command computer indicates the direction necessary to change the thrust to increase the aircraft's flight path angle so that the aircraft returns to the glide path. As the thrust level is varied according to the thrust command signal, an angle of attack sensor senses the changes in the angle of attack of the aircraft and a pitch command computer produces a pitch command signal to maintain the angle of attack at a desired level determined from the desired airspeed. In addition to the approach mode, the control system

offers advantages in the take off, climb, hold, maximum range, severe turbulence, and descent modes of an aircraft's operation. The cruise mode operates similar to prior art systems.

3,714,826
INDUCTION LIQUID FLOW METER AND METHOD OF ELECTRO-MAGNETICALLY DETERMINING FLOW RATE OF LIQUID

Yorio Tsunoda, Kawasaki, and Shigeyuki Takamatu, Totsuka-ku, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed March 5, 1971, Ser. No. 121,435
Claims priority, application Japan, March 10, 1970, 45/19691
Int. Cl. G01f *1/00*; G01p *5/08*
U.S. Cl. 73—194 EM **6 Claims**

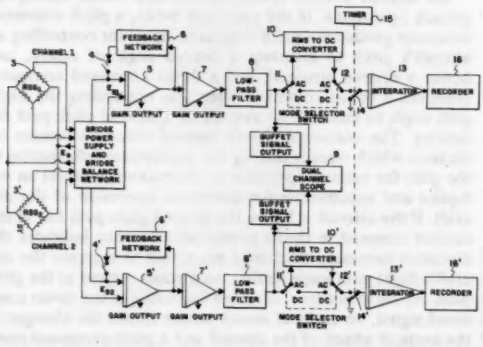


An induction liquid flow meter wherein a device for generating a magnetic field shifting along a liquid passage is energized from a power source of fixed frequency. The power P supplied to the magnetic field generating device is measured and the slip *s* is determined from the measured power P. The flow rate V of the liquid through the liquid passage is then determined from the measured value of slip *s* in accordance with a predetermined relationship between slip *s* and flow rate V.

3,714,827
VARIABLE TIME BASE INTEGRATOR CIRCUIT FOR BUFFET SIGNAL MEASUREMENTS

Colossie N. Batts, 17 Berkeley Place, Newport News, Va. 23602

Filed Nov. 12, 1971, Ser. No. 198,222
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 **10 Claims**

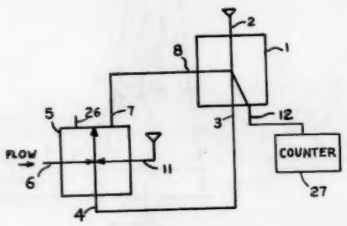


A measurement circuit to obtain buffet data from wind tunnel models wherein a signal proportional to the average RMS value of buffet data is produced for subsequent recording. Feedback means are employed to suppress the D.C. portion of signals developed by the strain gages during dynamic testing. Automatic recording of gain settings of amplifiers employed in the circuit is also provided.

3,714,828
FLUIDIC DIGITAL PNEUMOTACHOMETER

Gerald Durkan, 6 Emerson Street, Uniontown, Pa.

Filed Oct. 26, 1970, Ser. No. 83,885
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 R **8 Claims**

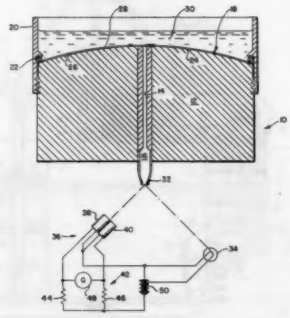


A device for measuring fluid flow comprises a fluid oscillator including a feedback path whose RC time constant may be varied in response to the flow being measured, such that the frequency of oscillation is proportional to the rate of flow. A proportional fluid amplifier has a power stream input and one output connected in the feedback path of a NOR-type oscillator, and the flow being measured is applied as a control input signal to the amplifier to effectively vary the RC time constant of the feedback path. The oscillator produces fluid output pulses at a rate proportional to the flow being measured, and these pulses are counted to provide a digital indication of the flow rate.

3,714,829
PRESSURE MEASURING SYSTEM

Paul T. Gilbert, Los Altos Hills, Calif., assignor to Beckman Instruments, Inc.

Filed June 29, 1970, Ser. No. 50,463
Int. Cl. G01l *9/00*
U.S. Cl. 73—398 R **27 Claims**

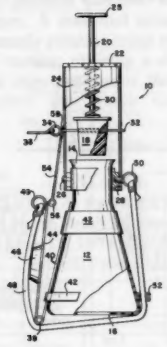


A pressure measuring system including a light source and a pressure sensitive membrane illuminated by the light source and adapted to reflect the light in a manner dependent upon the pressure being sensed. A sensor is illuminated by the reflected light and includes a photosensitive detector connected in a Wheatstone bridge circuit lacking diagonal bilateral symmetry.

3,714,830
WATER SAMPLING DEVICE

Robin S. Keir, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 26, 1971, Ser. No. 128,395
Int. Cl. G01n *1/10*
U.S. Cl. 73—425.4 R 2 Claims

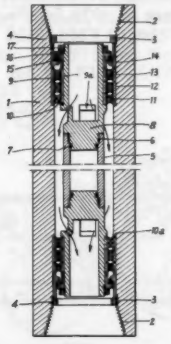


A water sampling device capable of carrying a conventional laboratory-type flask container having a neck opening and a bottom opening with means for closing each of said openings to capture a water sample therein at a preselected water depth whereby the contamination problems of transferring the water sample to another container for laboratory analysis are avoided.

3,714,831
DEVICE FOR SUSPENDING MEASURING INSTRUMENTS INSIDE DRILLING ASSEMBLY

Claude Quichaud, Billere; Jean-Pierre Le Peuvedic, and Jacques Tinchon, both of Pau, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed Sept. 3, 1970, Ser. No. 69,235
Claims priority, application France, Sept. 5, 1969, 6930325
Int. Cl. G01d *11/10*; G01l *19/14*
U.S. Cl. 73—431 10 Claims

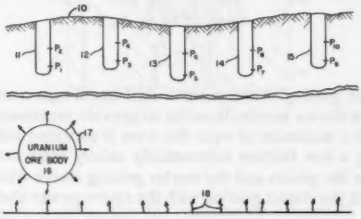


A device for suspending a measuring instrument in a drilling assembly comprising: a drill-collar designed to receive the measuring instrument; at least one connecting member attached to the measuring instrument and provided with a shoulder; a number of suspension rings consisting of three sections integrated by vulcanization i.e., a first frame, a second frame having the same center line and an annular elastomeric body between said frame, said suspension rings bearing by one of their frames on said shoulder; a first permanent seat on the connecting member through which said rings are attached to the connecting member; a second permanent seat on the drill-collar bearing on the other frame of said suspension rings and an annular part supported between said seats and made of an elastomer having a greater rigidity than that of the elastomer used to make the suspension rings.

3,714,832
GEOTHERMAL EXPLORATION

Eddie P. Howell, Plano; Jack E. Hardison, Garland, and William M. Campbell, Irving, both of Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,285
Int. Cl. G01v *9/00*
U.S. Cl. 73—432 R 3 Claims

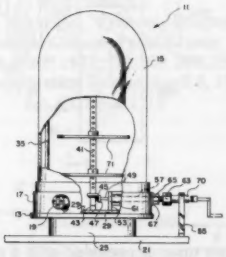


A uranium prospecting system based on the determination of temperature anomalies in the earth's crust. The earth heat flux is measured at preselected points in shallow boreholes in order to detect heat given off as a result of radioactive decay. Localized anomalies are indicative of concentrations of radioactive materials.

3,714,833
TEST STAND SYSTEM FOR VACUUM CHAMBERS

Dewey F. Newman, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 23, 1971, Ser. No. 211,411
Int. Cl. G01d *21/00*
U.S. Cl. 73—432 SD 4 Claims



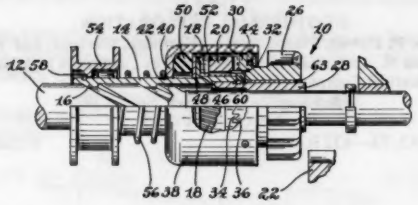
A test stand system for supporting test items within a vacuum chamber comprising a frame adapted to conform to the inside of the vacuum chamber and supporting a central vertical shaft which shaft is rotatable on bearings located at each end thereof. The shaft is rotated through a drive that is manually actuated externally of the vacuum chamber. A plurality of vertically spaced plates are adjustable fixed to the vertical shaft for supporting various test "setups" as required. The test items may be rotated during a test without disturbing the vacuum.

3,714,834

ENGINE STARTING GEARING

James J. Digby, Elmira, N.Y., assignor to The Bendix Corporation

Filed March 12, 1971, Ser. No. 123,498
Int. Cl. F02n 15/06
U.S. Cl. 74—6 6 Claims



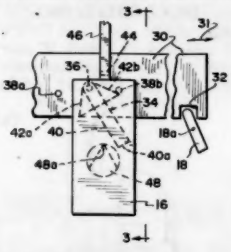
Starter gearing of the positive shift dentil type overrunning clutch is shown herein. In order to provide maximum service life with a minimum of wear the drive is provided with means forming a low friction substantially axially solid connection between the pinion and the starter gearing sleeve which interconnects the starter gearing with the rotary power shaft.

3,714,835

TUNER PUSHBUTTON SYSTEM WITH AUTOMATIC BAND MEMORY

Jack C. Fiore, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed April 21, 1971, Ser. No. 135,912
Int. Cl. F16h 35/18
U.S. Cl. 74—10.33 3 Claims



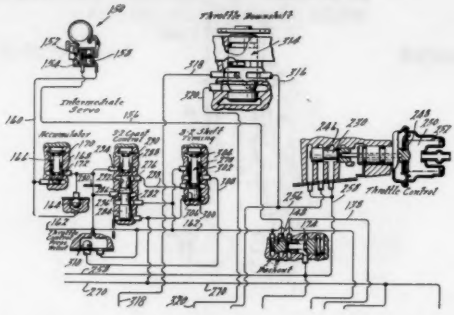
A pushbutton tuner is provided with a plurality of memory tabs pivotally secured to a slide plate which is located adjacent the pushbuttons. The slide plate is fastened to a band selector switch which is shiftable between one or the other of the two band positions upon movement of the slide plate between its two extreme positions. A depending finger on each of the pushbuttons sets the mode or band of the associated memory tab depending on the position of the slide plate when a particular radio station is set on the memory pushbutton mechanism. Once the radio station is set, the pushbutton mechanism will automatically return to the tuned station setting as well as the proper band setting regardless of the band setting then in effect.

3,714,836

AUTOMATIC TRANSMISSION CONTROLS FOR AN AUTOMOTIVE VEHICLE DRIVELINE

Stanley L. Pierce, Jr., Birmingham, and William C. Winn, Inkster, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 16, 1971, Ser. No. 115,454
Int. Cl. F16h 3/74; B60k 21/00
U.S. Cl. 74—752 C 14 Claims



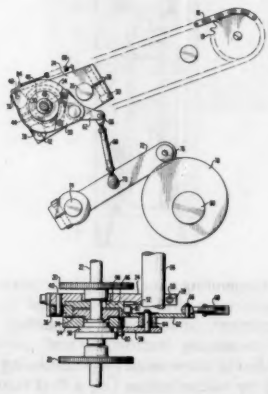
An automatic control valve circuit for controlling the application and release of fluid pressure operated servos in an automatic power transmission mechanism for an automotive vehicle driveline including pressure booster valve means for augmenting the servo pressure during coast braking of the vehicle at high speeds and limiting that pressure to a predetermined maximum value, and valve means for cushioning the application of a reaction brake during a ratio change to an underdrive condition whereby harshness in the ratio shifts to the underdrive ratio is reduced and excessive load on the hydraulic pump for the circuit is avoided.

3,714,837

INDEXIBLE CLUTCH MECHANISM

Ole R. Jensen, 126 Nottingham, Montvale, N.J., and Preben W. Jensen, 21 Southside Avenue, Somerville, N.J.

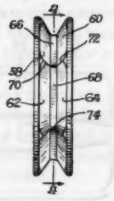
Filed June 23, 1970, Ser. No. 48,965
Int. Cl. F16d 27/01
U.S. Cl. 74—125.5 8 Claims



An incremental, angular, intermittent input motion is provided by means of a cam and follower arrangement to a dou-

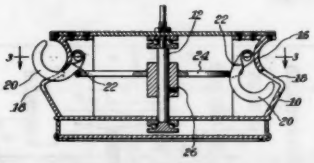
ble acting clutch mechanism. The angular input motion will be imparted to an output member through a portion of the one-way clutch mechanism and any attempt to overrun the predetermined indexing angle will be prevented by the other portion of the double acting one-way clutch mechanism. Any retrograde motion of the output member will be resisted by the binding of the input linkage connected intermediate the double acting one-way clutch mechanism and the cam follower to thereby provide positive control of the output member at all times. A modified arrangement provides for converting a constantly rotating input motion to a variable intermittent output motion utilizing a double acting one-way clutch mechanism operable under the control of a pair of pawls which control the clutch locking and unlocking member.

3,714,838
SHEAVE FOR RATCHET BLOCK
Robert E. Gilson, 4 North Franklin Avenue, Madison, Wis.
Filed Sept. 11, 1970, Ser. No. 71,568
Int. Cl. F16h *55/36*
U.S. Cl. 74—230.24 **11 Claims**



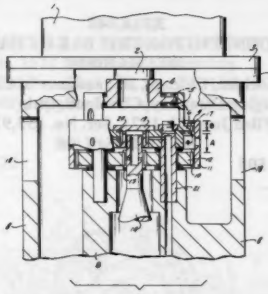
The line-receiving groove of the sheave includes a plurality of opposed inwardly converging shoulders on the sides of the groove and a coplanar corner in the innermost portion of the groove. The configuration is especially adaptable to ratchet blocks in that little effort is required to hold the line against a strong pull, and the line may be easily released in the direction of pull without binding or undue wear.

3,714,839
PULLEY WITH BELT CLAMPING MEANS
Timothy Watson, 1149 Tiffany St., Bronx, N.Y. 10459
Filed Mar. 30, 1971, Ser. No. 129,440
Int. Cl. F16h *55/36*
U.S. Cl. 74—230.24 **2 Claims**



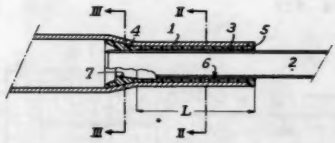
A horizontal wheel having a peripheral circular groove is rotatable about a vertical axis. A plurality of hooks having released open positions and taut closed positions are disposed about the groove to cooperate with a flexible line engaging the groove. Cam means cooperate with the hooks control the open or closed positions of same in a manner at which rotation of the wheel causes the hooks to individually open and close in predetermined manner.

3,714,840
DRIVE SHAFT
Walter K. Jekat, Munich, Germany, assignor to Klein Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany
Filed Sept. 29, 1971, Ser. No. 184,833
Claims priority, application Germany, Oct. 3, 1970, P 20 48 681.1
Int. Cl. F16h *1/06, 1/20*
U.S. Cl. 74—421 A **5 Claims**



A rotary shaft carries for rotation an externally toothed coupling gear, and axially spaced therefrom is a planetary drive having a sun gear and planetary gears which mesh with the sun gear and all of which are rotatable about axis paralleling that of the coupling gear. An internally toothed ring gear surrounds the primary gears and coupling gear and is movable axially between a first and a second position in which it is respectively in and out of mesh with the teeth of the coupling gear. It may be continuously in mesh with the planetary gears or it may be out of mesh with them when in the second position. A removable detent prevents the ring gear from moving out of its first to its second position, and another detent prevents the ring gear—when data has been moved from first to second position after removal of the first detent—for moving beyond the second position.

3,714,841
TELESCOPIC DEVICE FOR TRANSMITTING ROTARY MOVEMENT
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed April 1, 1971, Ser. No. 130,256
Claims priority, application France, April 3, 1970, 7012204
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **5 Claims**



This invention relates to a telescopic device for transmitting rotary movement, utilizable in particular for the steering column of a vehicle, comprising a sleeve, a shaft inside the sleeve and sliding with respect to this latter and a lining made of deformable material disposed between the sleeve and the shaft and fixed to one of these two elements, a sufficient clearance being provided between the zones opposite the slid-

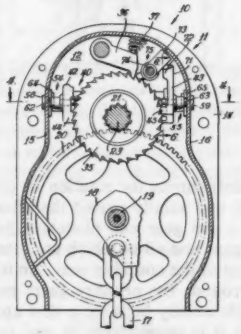
ing members in order to avoid requirement for their adjustment, wherein the clearance is eliminated over a portion of the zones opposite the lining and the element sliding with respect thereto, this ensuring a localized assembly with locking due to a deformation upon assembly of the lining.

3,714,842

PIVOT MOUNTING FOR TRIP BAR OF HAND BRAKE MECHANISM

William F. Koehler, Chicago, Ill., assignor to Cleveland Hardware & Forging Company, Cleveland, Ohio

Filed June 23, 1971, Ser. No. 155,915
Int. Cl. G05g *1/08*
U.S. Cl. 74—505 **2 Claims**



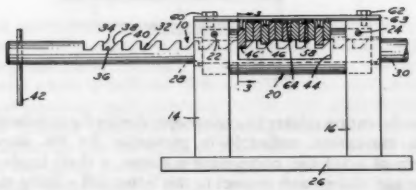
The trip bar of a hand brake mechanism comprises a tie bar having a lever at each end for releasing the driving connection between a ratchet wheel and a gear wheel rotatable with a chain winding drum, each lever having a pivot aperture for receiving a pivot pin extending inwardly from the side wall of the brake mechanism housing. Each pivot pin has an annular groove for receiving a U-shaped slot in a plate like pin keeper juxtaposed to the respective side wall of the housing to hold the pivot pin in operative position. A cylindrical spring guide is secured to each pin keeper to receive a coil compression spring arranged to bias the respective lever to maintain the driving connection.

3,714,843

ADJUSTABLE LATCHING MECHANISM

Robert A. Bracey, 4628 Johnathan, Dearborn, Mich.

Filed June 15, 1971, Ser. No. 153,242
Int. Cl. G05g *5/06*
U.S. Cl. 74—527 **17 Claims**



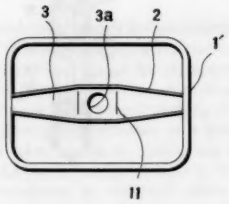
The adjustable latching mechanism functions on the vernier principle. In the preferred embodiment, a row of pivotally mounted side-by-side detent elements corresponds to a vernier scale. A latching element having a plurality of recesses corresponds to the regular measuring scale. The latching element is movable with respect to the detent elements. The detent elements are biased towards engagement with the recesses. At any given relative position of the detent elements and latching element, one of the detent elements will always be close to or in alignment with one of the recesses in accordance with the vernier principle for pivotal movement thereinto to result in locking engagement.

3,714,844

STEERING WHEEL CONSISTING OF A LIGHT FRAME INTEGRALLY MOULDING, PROCESSED FROM A FLAT PLATE

Jo Tsuda, Aichi-ken, Japan, assignor to Masakazu Inagaki, Aichi-ken, Japan

Filed Jan. 22, 1971, Ser. No. 108,935
Claims priority, application Japan, Jan. 27, 1970, 45/7488; Aug. 31, 1970, 45/76577; Aug. 31, 1970, 45/76578; Aug. 31, 1970, 45/76579; Aug. 31, 1970, 45/76580; Aug. 31, 1970, 45/76581
Int. Cl. B62d *1/04*
U.S. Cl. 74—552 **2 Claims**



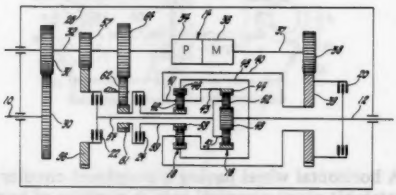
A steering wheel for a motor vehicle having a frame with ring, spoke and boss portions. The spoke portion has cuts to absorb mechanical shocks. The ring, spoke and boss portions define a space to enclose required driving instruments and at least a part of the ring portion is coated with covering material. The ring portion is noncircular and the steering wheel spokes enclose an air bag therein.

3,714,845

HYDROMECHANICAL TRANSMISSION

James J. Mooney, Jr., Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1971, Ser. No. 174,317
Int. Cl. F16h *47/04*
U.S. Cl. 74—687 **4 Claims**

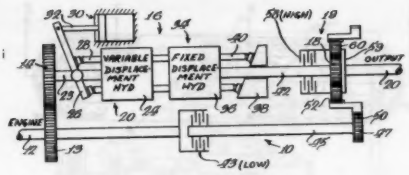


A hydromechanical transmission having a variable ratio hydrostatic drive unit, two planetary gear sets and three friction drive establishing devices combined to provide an all-hydrostatic drive in a low speed range in both forward and reverse and split power or hydromechanical drives into higher speed ranges in forward.

3,714,846
HYDROSTATIC-DIFFERENTIAL TRANSMISSION

Joseph E. Louis, Rockford, and George A. Schauer, Belvidere, both of Ill., assignors to Sundstrand Corporation

Filed Feb. 23, 1971, Ser. No. 117,948
Int. Cl. F16h 47/04, 47/00
U.S. Cl. 74—687 25 Claims

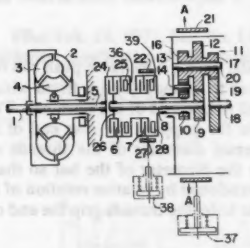


A hydromechanical transmission having plural power paths, one being a mechanical path and the other being a hydraulic path with an output differential for combining the torque of the two paths and providing an output for the transmission, there being provided a low speed plural path mode effected by clutching one of the differential elements to the input shaft, and a high speed straight hydraulic mode effected by locking the differential elements together for rotation as a unit. Both the low and high speed modes have forward and reverse speeds. A transmission ratio and mode control is provided that compensates for the difference in hydraulic displacement in the two modes so that the transmission may be easily shifted from zero output in the low speed mode to zero output in the high speed mode and vice versa.

3,714,847
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

Fmihiro Ushijima, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-cho, Aichi-ken, Japan

Filed Feb. 10, 1971, Ser. No. 114,178
Claims priority, application Japan, Feb. 13, 1970, 45/12,896
Int. Cl. F16h 3/44
U.S. Cl. 74—753 10 Claims

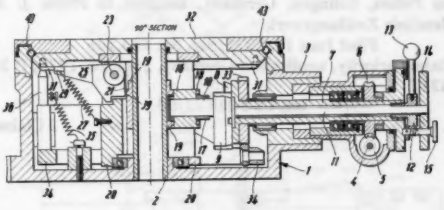


A hydraulic control system for automatic transmissions is applied to a multistage change gear mechanism including hydraulically actuated friction elements including clutches and brakes, selectively cooperable with components of the mechanism to establish the input-output gear ratio, and includes an accumulator which lessens the shock, resulting from the pressure changes during shifting, by controlling the transient pressure change of the hydraulic fluid supplied to hydraulic servos actuating the friction elements. Shift valves, operable in accordance with engine output and vehicle speed, control the supply and exhaust of hydraulic fluid relative to the servos. A reciprocable piston divides the accumulator into first and second chambers, with the first chamber controlling the pressure change to the hydraulic servos during shifting and the second chamber controlling operation of the accumulator. A return valve exhausts the second chamber of the accumulator in connection with operation of the shift valve upon shifting. The accumulator piston returns to its initial position after completion of shifting.

3,714,848
STEP-BY-STEP TRANSMISSION

Detlef Hofmann, 7531 Kieselbronn, Germany

Filed Dec. 21, 1970, Ser. No. 100,139
Claims priority, application Germany, Dec. 22, 1969, P 19 64 263.8
Int. Cl. B23b 29/32
U.S. Cl. 74—822 13 Claims

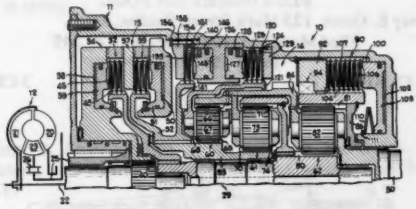


A step-by-step transmission, or indexing mechanism, or dividing head, in which a part is provided which is adapted to be indexed, for instance in rotation. For indexing the part, a crank shaft is provided adapted for being driven in rotation and having a crank pin thereon which is adjustable in the radial direction of the crank shaft. As the shaft and crank pin rotate, a first member is driven in reciprocation and oscillation by the crank pin while a second member is driven in oscillation. The second member carries a follower which engages the part to be indexed in one direction of oscillation of the second member, the said engaging being under the control of the first member, while in the other direction of oscillation of the second member, a locking arrangement locks the part against movement.

3,714,849
AUTOMOTIVE TRANSMISSION

James G. Smith, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 21, 1970, Ser. No. 99,803
Int. Cl. B60k 21/00; F16h 57/10
U.S. Cl. 74—869 16 Claims



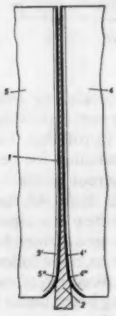
A hydraulic control system for an automatic transmission having a hydraulic converter, fluid pressure operated friction engaging devices to provide a plurality of speed ratio drive trains upon serial automatic actuation

of shift valves to upshifted positions by vehicle speed-responsive governor pressure and downshiftable by throttle-responsive pressure, a fluid-operated friction brake for low speed ratio, and a control valve for the brake and a manual valve to provide fluid pressure to the brake only in the downshifted position of the shift valves; an accumulator to control engaging fluid pressure of the engaging devices; and a stall control valve functioning to change the effective regulated output pressure from a regulator valve and to provide increased actuating fluid pressure during torque multiplication of the torque converter.

ERRATUM

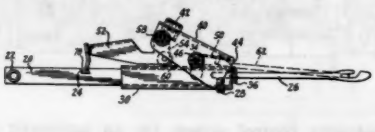
For Class 74—15.4 see:
Patent No. 3,715,704

3,714,850
METHOD OF MANUFACTURING OF KNIVES
Hans Peters, Solingen, Germany, assignor to Firma J. A. Henckels Zwillangswerk
Filed June 15, 1971, Ser. No. 153,206
Claims priority, application Germany, June 16, 1970, P 20 29 621.3
Int. Cl. B21k *11/00*
U.S. Cl. 76—104 2 Claims



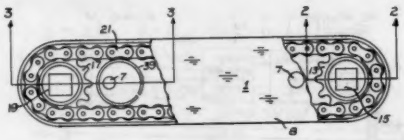
A method of producing of knives with a blade compacted by cold working which comprises the steps of compacting the blade of the knives after precision forging of a sling and of a haft by cold-rolling crosswise to its longitudinal axis with a roll pressure leading nearly to the yield point, and thereafter cutting the same to its outline shape.

3,714,851
PLUG INSERTION TOOL
Harvey E. Orser, 123 Mark Street, Pontiac, Mich.
Filed March 23, 1971, Ser. No. 127,249
Int. Cl. B60c *25/16*
U.S. Cl. 81—15.7 3 Claims



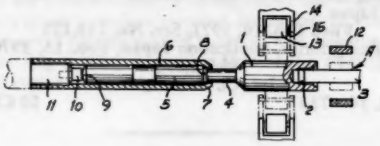
A needle, a jaw slidably mounted adjacent the needle, and a handle for pivoting the jaw to secure and stretch a plug connected between the jaw and the needle.

3,714,852
POWER TRANSFER DEVICE
Joseph A. Giangrasso, 11221 Elvessa St., Oakland, Calif. 94605
Filed June 3, 1971, Ser. No. 149,612
Int. Cl. B25f *17/00*
U.S. Cl. 81—57.3 2 Claims



A power transfer device for transferring the power of a hand tool to work located in an otherwise hard to reach location, and comprising a narrow elongated housing with a sprocket at each end and coupled by a chain drive. The one sprocket has an axial polygonal opening for engagement with a hand tool, while the other sprocket is provided with an axial extension of polygonal section to accommodate a socket.

3,714,853
AUTOMATIC LATHES
Andre Lechot, Orvin, Switzerland
Filed Dec. 18, 1970, Ser. No. 99,498
Claims priority, application Switzerland, Dec. 23, 1969, 19191/69
Int. Cl. B23b *13/02*
U.S. Cl. 82—2.5 2 Claims

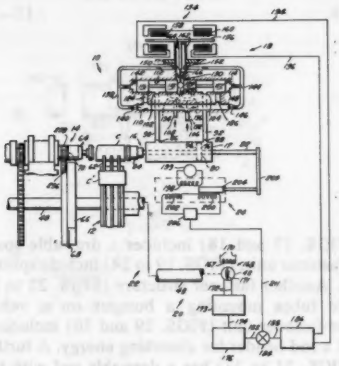


An automatic lathe having a movable push rod for engaging the rear end of a bar to be machined is fitted with a member rotatably connected to one end of the push rod. This member has a threaded hole for gripping the rear end of a bar to be machined, the internal diameter of the threads of the hole being smaller than the diameter of the bar so that when the end of the bar is introduced by relative rotation of the bar and the member into the hole, the threads grip the end of the bar.

3,714,854
MACHINE FOR PERFORMING AN OPERATION ON ARTICLES
Edward Frank Kubacki, Arlington Heights, Ill., assignor to American Can Company, Greenwich, Conn.
Filed July 2, 1971, Ser. No. 159,401
Int. Cl. B23b *3/04*
U.S. Cl. 82—101 R 29 Claims

A high speed mechanical-electric-hydraulic system for synchronizing the indexing and dwell of a multi-pocketed article aligning turret and the operation of an operating station

with the forward and reverse strokes of a hydraulically actuated reciprocable feed slide which transfers successive articles into and out of the operating station from and to the turret, wherein during separate angular portions of a single rotational cycle of a rotating drive means of the system, a primary electrical command signal is generated by the mechanical-electrical components of the system to control the metering of fluid in the hydraulic component to initiate each forward and



reverse stroke of the slide, the motion of the slide thereby generating a secondary electrical signal which is impressed on the primary electrical signal to produce a modified electrical signal which controls the metering of hydraulic fluid to the slide to control the slide during the balance of each stroke, and during other separate angular portions of the single rotational cycle of the rotating drive means, the turret is indexed and the station is operated by the drive means.

3,714,855

PROCESS AND APPARATUS FOR SETTING A FLEXIBLE ELONGATE BODY IN A PARTICULAR FORM

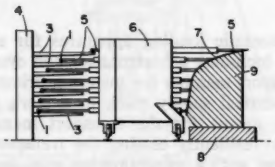
Pieter Klaas Noordenbos, Stokhorstpad 1, Enschede, Netherlands

Filed Feb. 18, 1971, Ser. No. 116,399

Claims priority, application Netherlands, Feb. 20, 1970, 7002474

Int. Cl. B26d *3/00*

U.S. Cl. 83—1 **11 Claims**



A process for setting a flexible elongate body, e.g. a wire-shaped body, supported by a number of bearings in a particular flowing form in which the bearings are placed in such relative positions as to cause the body to assume a desired shape, and while the body and the bearings are being positioned relative to each other, they are rotated about their relative geometrical axes. Also an apparatus for carrying out this process is disclosed.

3,714,856

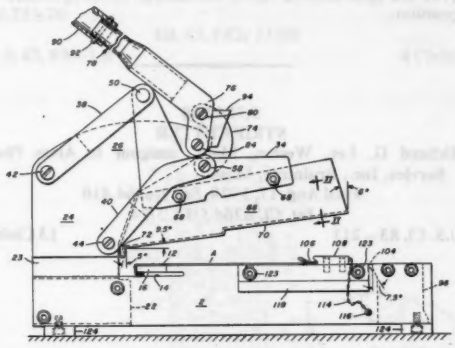
SIDING CUTTER

Marchand B. Hall, Olympia Fields; Irving Handler, Calumet City, both of Ill., and Calvin E. Kelly, Franklin Township, Allegheny County, Pa., assignors to United States Steel Corporation

Filed Feb. 2, 1971, Ser. No. 111,964

Int. Cl. B26d *7/16*

U.S. Cl. 83—453 **10 Claims**



The cutter consists essentially of an upright supporting frame having a pair of fixed shear blades attached one to each side of the bottom of the frame and extending horizontally therefrom in spaced parallel relation in a plane below the upper portion of the frame which upper portion curves outwardly and horizontally. A pair of supporting plates mounted loosely one on each side of the frame support carry an upper shear blade for coaction with the fixed blades. A linkage means pivotally connects the supporting plates to the support frame and to an actuating handle in such a manner that the upper shear blade moves in a path in a plane from the upper portion of the support frame to a point between the fixed shear blades at a constant angle relative to the surface of the siding when the handle is manipulated. The upper surfaces of the fixed shear blades are formed with fixed stop members. Interchangeable auxiliary fixed blades and stop members are provided to hold and shear a length of siding. The portion of the upstanding frame immediately adjacent to and immediately above the ends of the fixed shear blades attached to the frame is formed with a thickness less than the distance between the fixed shear blades so that the cutter is, in effect, a throatless cutter for the purpose of facilitating making long cuts in siding.

3,714,857

PUNCH

William D. Stuertz, Glen View, and Sam Martorano, Des Plaines, both of Ill., assignors to Swingline Inc., New York, N.Y.

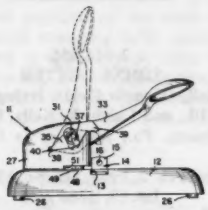
Filed Sept. 9, 1970, Ser. No. 70,837

Int. Cl. B26d *7/02*

U.S. Cl. 83—468 **7 Claims**

A punch is shown having a body, a punch element pivotally connected to the body, and a guide member slidably movable within the body. The guide member has indicia thereupon which are selectively viewable through an opening within the

body. A latch structure is provided to selectively retain the guide member in various positions. Holding means are also

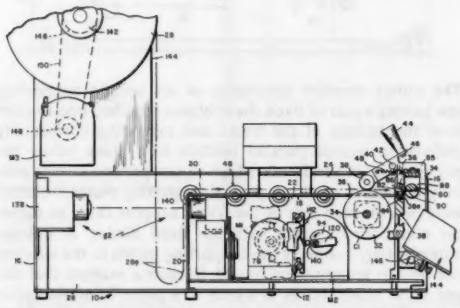


provided to selectively retain the punch element in depressed position.

3,714,858
STRIP CUTTER

Richard G. Lee, Weston, Mass., assignor to Alves Photo Service, Inc., Braintree, Mass.

Filed Aug. 17, 1970, Ser. No. 64,410
Int. Cl. B26d *5/32, 5/34*
U.S. Cl. 83—211 **13 Claims**



A rotatable feed roll, mechanism including a one-way clutch for effecting intermittent non-linear rotation of the feed roll through a predetermined angle of rotation to advance strip material to an oscillatable cutter supported beyond the feed roll in the direction of movement of the strip, a detector comprising a lamp and photocell supported adjacent the strip in a position to detect indicia thereon when the strip has slowed to near stop at the end of an interval of non-linear rotation of the feed roll, and means operable by the detector in response to the indicia to effect oscillation of the cutter.

ERRATUM

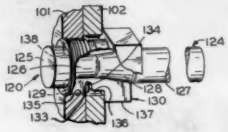
For Class 83—831 see:
Patent No. 3,714,974

3,714,859
ENERGY ABSORBING STRUCTURES

Myron D. Tupper, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Sept. 18, 1970, Ser. No. 73,548
Int. Cl. F16b *31/02*; F16d *19/00, 63/00*
U.S. Cl. 85—1 R **2 Claims**

Fastener units (FIGS. 1 and 2) include drawable rods having drawable portions and heads of the same diameter and wedging units tensioning the rods. Another fastener unit (FIG. 3) has a die, a threaded head and a nut. A further fastener unit (FIG. 4) has a combined die and threaded plug connected by a frangible portion. Further fastener units (FIGS. 5 to 12) include capscrew-like drawable rods. Another fastener unit (FIGS. 13 and 14) has a drawable rectangular bar. A further fastener unit (FIGS. 15 and 16) has a die holder into which a drawing die strip is inserted from one side. Another fastener

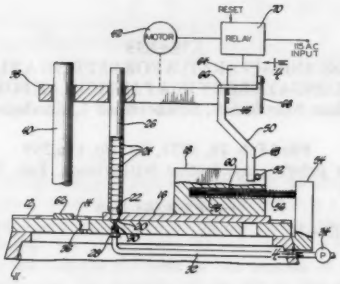


unit (FIGS. 17 and 18) includes a drawable spacer sleeve. Other fastener units (FIGS. 19 to 24) include splittable spacer sleeves. Another fastener structure (FIGS. 25 to 28) has extrudable tubes mounting a bumper on a vehicle frame. Another fastener unit (FIGS. 29 and 30) includes a drawing die and a rod bender for absorbing energy. A further fastener unit (FIGS. 31 to 33) has a drawable rod with two tapered drawable portions.

3,714,860
PRIMER METERING APPARATUS FOR AMMUNITION LOADING MACHINES

Robert A. Leich, Southfield, Mich., assignor to Camdex Inc., Detroit, Mich.

Filed May 13, 1971, Ser. No. 142,955
Int. Cl. F42b *33/04*
U.S. Cl. 86—23 **12 Claims**

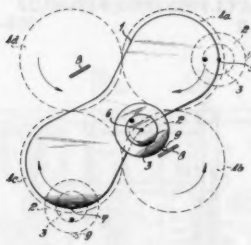


An automatic loading apparatus for small arms ammunition including a horizontally and cyclically displaceable transport member for metering primers from a gravity-feed vertical supply stack to a work station wherein the drive means for the transport member includes a spring for resiliently biasing the transport member into engagement with a programming cam during movement toward the work station, which cam positively drives the transport member back to the supply. Apparatus for vacuum cleansing the metering area is provided. An automatic power interruption feature is provided whereby the drive motor power is interrupted in the event the transport member fails to move out of the path of a switch carried by an upper platen assembly which forms part of the drive means.

3,714,861
APPARATUS FOR REVERSING THE BOBBINS IN A BRAIDING MACHINE

Reiner Strangfeld, Bundesrepublic Deutschland, Germany, assignor to August Herzog Maschinenfabrik, Bundesrepublic Deutschland, Germany

Filed Feb. 10, 1971, Ser. No. 114,280
Claims priority, application Germany, Feb. 10, 1971, P 20 06 792.9
Int. Cl. D04c *3/06*
U.S. Cl. 87—51 **4 Claims**

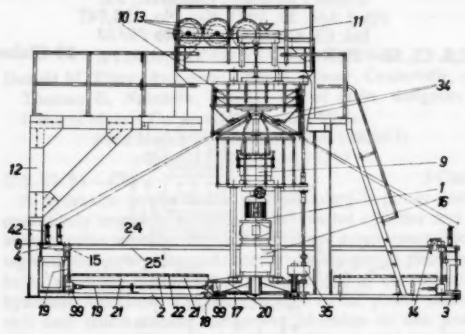


An apparatus for reversing the position of the bobbin of braiding machines wherein each bobbin is rotatably coupled to a bobbin base which includes a bobbin locking mechanism for releasably coupling the bobbin base to the bobbin so that after the bobbin is accelerated in the direction of reversal caused by the tracking kinemetics, the locking mechanism is released during the counter-rotation of the bobbin base so that inertia of the bobbin rotator allow the causes it to rotate through the required angle relative to the bobbin base.

3,714,862
BRAIDING MACHINE FOR BRAIDING KNOTLESS NETTING

Heinz Berger, Oldenburg, Germany, assignor to August Herzog Machinenfabrik, Oldenburg, Germany

Filed Oct. 2, 1970, Ser. No. 77,509
Claims priority, application Germany, Oct. 3, 1969, P 19 49 893.2
Int. Cl. D04c *1/00, 3/00, 3/02*
U.S. Cl. 87—8 **19 Claims**

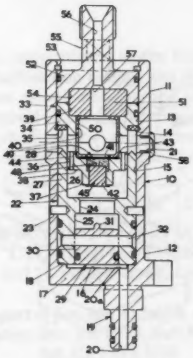


Lace braiding machine for braiding knotless netting. A mechanized braiding assembly is circularly arranged, in horizontal orientation, wherein two rows of wing wheels are provided, with means for carrying and interchanging net lacing needles, provision being made for tracks and track switches for the guidance of these needles. Braid elements formed in this assembly are transported to the upper central region of the machine, where braid lifter means, synchronized with the mechanism of the braiding assembly, complete the loops of the netting and provide for progressive transfer thereof to an overlying take-off unit.

3,714,863
GAS PRESSURE ACTUATORS

John Henry Sindall, Worcester, England, assignor to Imperial Metal Industries (Kynoch) Limited, Warwichshire, England

Filed Aug. 16, 1971, Ser. No. 172,115
Claims priority, application Great Britain, Aug. 18, 1970, 39,733/70
Int. Cl. F42c *15/00*
U.S. Cl. 89—1 R **4 Claims**

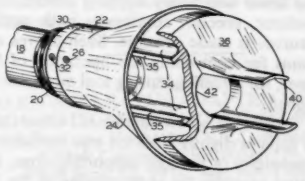


A pressure actuator for a missile system comprising a slide valve member slidable within a bore under combustion chamber gas pressure to close safety vents and operate a percussion priming device to fire an ignition charge, the latter producing gas to actuate the missile system.

3,714,864
MUZZLE ATTACHMENT FOR REDUCING THE RECOIL AND BLAST EFFECT OF GUNS

Robert J. Thierry, Averill Park, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed March 3, 1971, Ser. No. 120,389
Int. Cl. F41f *17/12*
U.S. Cl. 89—14 C **7 Claims**



In order to reduce the relatively high blast effect customarily encountered by personnel in the vicinity of the breech end of a large caliber gun equipped with a muzzle brake having a

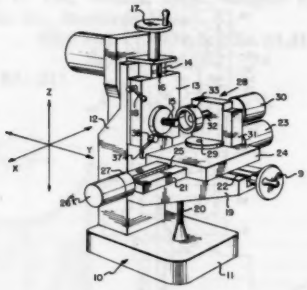
forwardly expanding conical nozzle for directing the discharge gases against a baffle plate spaced therefrom to the extent required to promote maximum braking efficiency, the portion of the brake between the muzzle end of the gun tube and the baffle plate is formed by forwardly extending diametrically spaced longitudinal bars which provide a minimum of interference with the shock waves produced by the passage of the discharge gases through the muzzle brake. The distance between the nozzle and the baffle plate can be adjusted without the necessity for removing the muzzle brake from the gun tube.

3,714,865

APPARATUS FOR MILLING CAMS AND THE LIKE, AS FOR SWISS-TYPE SCREW MACHINE CAMS

John A. Villano, c/o CAM-APT 17 Brown Street, Waterbury, Conn.

Filed Jan. 7, 1971, Ser. No. 104,662
Int. Cl. B23c *1/18*
U.S. Cl. 90—13 C **5 Claims**



The invention is directed to a novel apparatus for milling Swiss-type screw machine cams. The invention provides a highly simplified and economical numerically controlled system enabling Swiss-type screw machine cams and similar articles to be milled with an ease and precision heretofore unattainable otherwise than with highly sophisticated and costly equipment. In its most typical application, the invention is utilized in the retro-fitting of an existing milling machine apparatus of otherwise conventional construction. Alternatively, the invention can be applied in the first instance, in connection with the manufacture of modified milling machines incorporating the new control system.

The system of the invention utilizes a conventional three axis milling machine, which is fitted out with a rotary table. Numerically controlled stepping motors are provided for the "X" and "Y" axes of the milling machine, as well as for the rotary table. An otherwise conventional linear interpolator system, which is substantially self contained and commercially available, is connected between one of the linear axis stepping motors and the rotary table stepping motor. By appropriate control of the linear and rotary stepping motors through the linear interpolator, precise, continuous path cutting of involute cam curves is made possible. Such curves are widely utilized in cams for controlling the operation of Swiss-type screw machines, for effecting cutting tool movement at a constant linear speed.

For some Swiss-type screw machines, where the desired cam contour departs slightly from the true involute to accommodate the geometry of the tool supporting arms, the system of the invention provides for programming of the linear and rotary axes to move in the nominal involute relationship, and the "Z" axis of the machine is actuated by a simple mechanical device to introduce the necessary minor geometrical corrections.

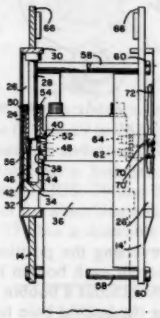
The system of the invention provides a highly simplified and economical system for performing a complex milling operation in the production of precision control cams for Swiss-type screw machines.

3,714,866

TOOL FIXTURE

Jack B. Ottestad, 1442 Muirlands Drive, La Jolla, Calif.

Filed Oct. 9, 1970, Ser. No. 79,596
Int. Cl. F01b *15/00*; F15b *15/22*
U.S. Cl. 91—216 R **17 Claims**



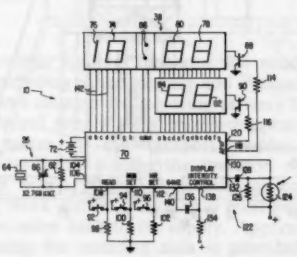
An opened-ended, four-sided structure for slidably retaining the tool therewithin, with a pilot dowel pin fixed to an end of the structure and extending therefrom into the structure. The pin is slidably received by a cylinder. The cylinder has pressured fluid inlet and vent ports in the wall thereof, and an external terminal end of the cylinder abuts a surface of the tool. The pin cooperates with an annular sleeve disposed about a portion of the inner cylinder wall to seal off the vent port until the cylinder, under pressured-fluid force, travels a predetermined distance to effect a tool movement stroke. Toward the end of the stroke, the vent port is uncovered and evacuates fluid from the cylinder.

3,714,867

SOLID STATE WATCH INCORPORATING LARGE-SCALE INTEGRATED CIRCUITS

Bruno M. Dargent, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

Filed Apr. 29, 1971, Ser. No. 138,547
Int. Cl. G04c *3/00*; G04b *19/30*
U.S. Cl. 58—50 R **20 Claims**



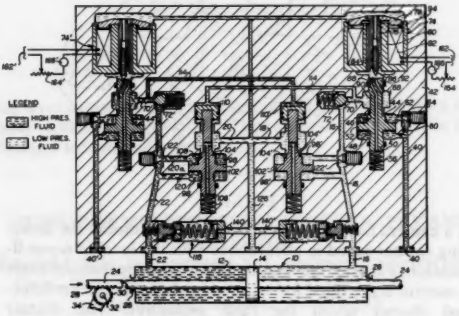
Disclosed is a solid state wristwatch having no moving parts. A crystal oscillator supplies a timing signal through a binary divider and display actuator to an electro-optical

display in the form of a digital array of light-emitting diodes. The vast majority of the electrical components of the watch are incorporated in one or more large-scale integrated circuits.

3,714,868
VALVE SYSTEM FOR PROPORTIONAL FLOW CONTROL FOR FLUID-OPERATED MOTOR

Slawomir Kowalski, Rockaway, and Donald A. Worden, Pompton Plains, both of N.J., assignors to Marotta Scientific Controls Inc., Boonton, N.J.

Filed Sept. 23, 1970, Ser. No. 74,612
Int. Cl. F15b *11/08, 13/04*
U.S. Cl. 91—420 **8 Claims**



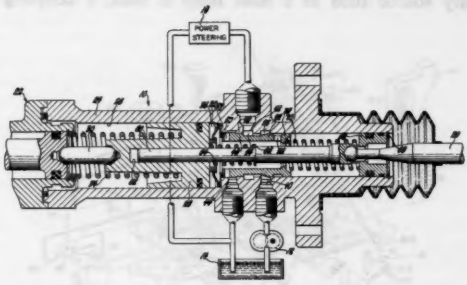
This system for controlling the flow of working fluid to and from a motor includes valves that regulate the working fluid flow so that it is proportional to the force applied to move the valves into open position regardless of changes in pressure in the system. The motor is double-acting and its movement is sometimes against the load and sometimes in a direction in which the load assists the movement of the motor. In the latter case it is important that the exhaust from the motor be regulated to control the speed since the supply of working fluid to the other end of the motor may produce excessive speed. Both the rate of inlet and exhaust of the working fluid, therefore, are determined by proportional flow control valves having their flow dependent upon the force applied to solenoids or other actuators for the valves.

3,714,869
HYDRAULIC POWER BRAKE UNIT

Donald M. Flory, Arcanum; Elton S. Moyer, Centerville, and Thomas D. Naismith, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed March 26, 1971, Ser. No. 128,357
Int. Cl. F15b *13/14, 13/10*
U.S. Cl. 91—434 **3 Claims**

A hydraulic power brake unit including a power piston operatively engaging a conventional master cylinder and an annular valve spool having differential end areas communicating with the power chamber formed by the power piston and being normally positioned in the housing to communicate hydraulic fluid from a pressure source to the power steering unit and communicate the power chamber to the power source reservoir. When the brake pedal is actuated, an actuating spring acting between the valve spool and a reaction piston attached to the pedal pushrod is compressed and the valve spool is moved to restrict fluid communication from the pressure source to the power steering unit and divert the flow to the power chamber while simultaneously blocking communication of the power chamber to the reservoir so that the power chamber is pressurized and the power piston fluidly displaced to actuate the master cylinder. The power chamber pressure acts on the differential area of the valve spool to resist its movement by the actuating spring and causes it to function as a regulating valve which continuously provides a power

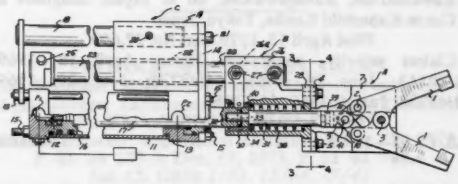


chamber pressure proportional to the force of the actuating spring. Upon a malfunction caused loss of hydraulic pressure the reaction piston moves into abutting engagement with the power piston to provide a rigid force transmitting link between the pushrod and the master cylinder whereby the brakes are actuated independently of the hydraulic boost.

3,714,870
DUAL GRIP ACTUATING UNIT WITH TRAVEL CYLINDER ASSEMBLY

Leland F. Blatt, 24121 Mound Road, Grosse Pointe Woods, Mich.

Continuation-in-part of Ser. No. 815,658, April 14, 1969. This application Dec. 14, 1970, Ser. No. 97,599
Int. Cl. F01b *9/00*
U.S. Cl. 92—140 **1 Claim**



For use with a work gripping assembly such as is shown in U.S. Pat. No. 3,371,953, the combination of a travel means and an actuating assembly which are separate components, with the travel means carrying the actuating assembly, and with mechanical movement provisions in the actuating assembly to enable it to be moved as a whole towards and away from the travel assembly, but with a quick action on the gripping assembly during movement of the actuating assembly towards the travel assembly.

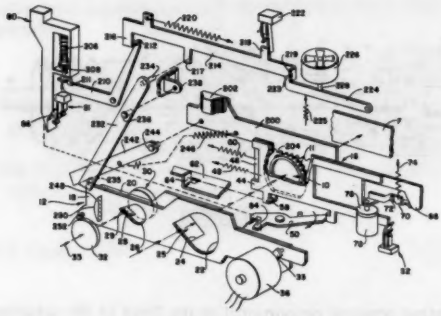
3,714,871
CAMERA APPARATUS ADAPTED FOR OPERATION WITH AUXILIARY LIGHT SOURCE

Richard J. Bresson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,710
Int. Cl. G03b *7/10*
U.S. Cl. 95—10 C **2 Claims**

An exposure control system for use in photographic apparatus which is adapted for operation with an auxiliary

source of illumination such as a flash lamp. In particular, the exposure control system includes a radiation sensitive element disposed to receive illumination from a scene and a mechanism coupled to the radiation sensitive element for varying the size of the exposure aperture as a function of the scene radiation directed onto the radiation sensitive element. In a second mode of operation wherein an auxiliary source such as a flash lamp is used, a coupling



mechanism is rendered operative for coupling a focusing mechanism associated with the camera lens to the aperture adjusting mechanism so that in the flash mode of operation, the shutter mechanism is set as a function of the focus distance. More specifically, the aperture adjusting mechanism tends to be driven by a motor until it engages the coupling mechanism which is set as a function of the focal distance.

3,714,872

PHOTOGRAPHIC FLASH EXPOSURE CONTROL SYSTEM

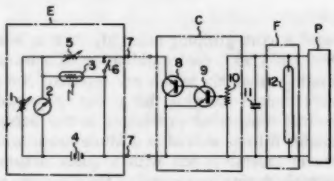
Yukio Mashimo, Meguro-ku, Tokyo; Seiichiro Mizui, Naka-ku, Yokohama-shi, Kanagawa-ken, and Yoshiyuki Takishima, Kawasaki-shi, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed April 13, 1970, Ser. No. 27,699

Claims priority, application Japan, April 18, 1969, 44/30113; June 20, 1969, 44/48735; June 20, 1969, 44/48736; June 6, 1969, 44/53050

Int. Cl. G03b *15/05*; H05b *41/02*

U.S. Cl. 95—10 CE **15 Claims**



A camera system comprises a flash device cooperative with a auto-flash mechanism in a camera. The flash device comprises a capacitor, a power supply circuit for charging the capacitor and a discharge lamp circuit including a discharge lamp. The flash device is further provided with a control circuit connected between the capacitor and the auto-flash mechanism for detecting the charge stored in the capacitor and providing output signal to control the auto-flash mechanism in the camera to obtain the optimum exposure.

3,714,873

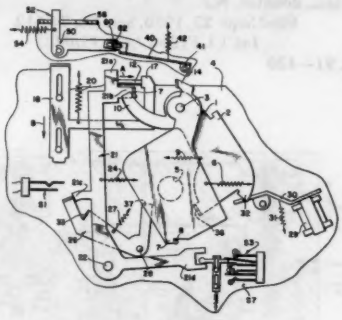
SHUTTER CONTROL APPARATUS FOR PHOTOGRAPHIC CAMERAS

Paul J. Ernisse, and Robert L. Reynolds, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 127,475, March 24, 1971. This application Jan. 24, 1972, Ser. No. 220,395

Int. Cl. 95 *60*; G03b *7/08*, *9/62*

U.S. Cl. 95—10 CT **18 Claims**



In a camera having a photoelectric timing circuit for determining shutter speed in accordance with the level of scene illumination, a shutter mechanism including a mechanical override control is provided for establishing a maximum predetermined shutter speed for flash exposures. The shutter mechanism includes an opening blade actuatable to initiate an exposure interval and a closing blade actuatable under the control of the timing circuit to terminate the exposure interval, and the override control includes a member actuatable to permit the opening shutter blade to close after a predetermined time. The override control member is adapted for actuation in response to insertion of a flashlamp unit into a recepticle on the camera and/or in response to actuation of a member accessible from the exterior of the camera.

3,714,874

PHOTOGRAPHIC APPARATUS FOR USE WITH LIGHT GENERATING DEVICES WHICH ARE RESPONSIVE TO MECHANICAL IMPULSES

Dieter Engelsmann, 8025 Unterhaching; Hubert Hackenberg, Munchen 21, and Horst Karl, Munchen 13, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 30, 1971, Ser. No. 158,256

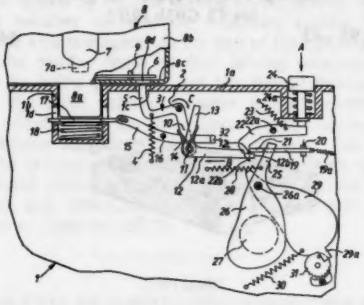
Claims priority, application Germany, July 3, 1970, P 20 33 150.4

Int. Cl. G03b *15/04*

U.S. Cl. 95—11.5 R **19 Claims**

A still camera for use with detachable flashcubes having lamps which are are associated with cartridges responsive to mechanical impulses to fire the associated lamps. The body of the camera supports a horizontal pivot pin for a first two-armed lever one arm of which carries the pivot pin for a second two-armed lever. The second lever can be pivoted with reference to the first lever during the first part of a first stage of movement of an actuating lever from a first to a second position, and the second lever pivots with the first lever during the next-following part of the first stage of movement of the actuating lever whereby the first lever causes an impeller in the flashcube to transmit an impulse to one of the cartridges for firing of a lamp at the exact moment when the actuating member opens the shutter during a second stage of its movement. During such second stage, the actuating lever is disengaged from the second lever so that a spring can retract the

first lever to its starting position. A blocking lever in the camera body can disengage the second lever from the actuating lever in response to detachment of the flashcube from the body so that the actuating lever can open the shutter while the first and second levers remain idle.

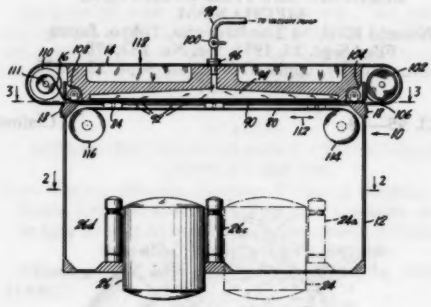


3,714,875

METHOD OF MULTISPECTRAL PHOTOGRAPHY AND PROTECTOR

Edward J. Yost, Jr., Northport, N.Y., assignor to Spectral Data Corp., Hicksville, N.Y.

Filed July 16, 1969, Ser. No. 842,133
Int. Cl. G03b *33/04*
U.S. Cl. 95—12.2 **4 Claims**



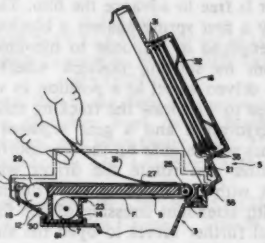
A multispectral camera simultaneously forms four black-and-white pictures of the same subject on a strip of photographic film. A different region of the electromagnetic spectrum is primarily employed in forming each picture. Simultaneously with the forming of the pictures, penlights mounted in the camera form on the film a number of fiducial marks associated with each picture. In projecting the pictures for viewing after they are developed, an additive color viewer is used having a separate projection lens for each picture, the lenses being movable with three degrees of freedom so that the projected images of the fiducial marks can be made to coincide. In this way, the projected images of the four pictures are accurately superimposed to produce a composite image in true or false color. The brightness, saturation, and hue of the projected images of the four pictures are then manipulated in order to extract a wide variety of data regarding the subject.

3,714,876

PHOTOGRAPHIC CARTRIDGE

Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1970, Ser. No. 33,676
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 **6 Claims**



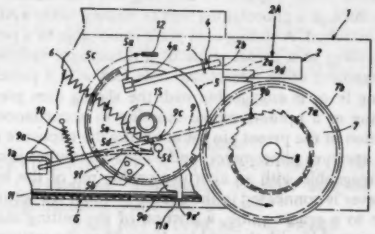
A cartridge of self-processing photographic film includes first and second supply chambers, one each for film and second or process elements, and a take-up chamber for collecting and storing processing waste material disposable with the cartridge. In a preferred form, film is supplied in the cartridge from a single roll and is advanced therefrom to a first position for exposure, then to a second position for processing, and finally to a take-up mechanism for winding the film back into a roll. Individual second elements are supplied as sheets in stacked relation in a second chamber, behind the film processing chamber, and are superposed or registered one at a time with the film for processing. After processing, the second sheet, with the image received thereon, is stripped from the film automatically and transported to the cartridge exterior at the same time the film is wound into the take-up chamber. Alternatively, the cartridge back may be opened for manual stripping of the finished print.

3,714,877

PHOTOGRAPHIC STILL CAMERA

Rolf Schröder, Baldham-Kolonie, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 23, 1972, Ser. No. 256,096
Claims priority, application Germany, May 27, 1971, P 21 26 279.3; Dec. 17, 1971, P 21 62 705.4
Int. Cl. G03b *1/62, 15/04, 17/42*
U.S. Cl. 95—31 FM **26 Claims**



A still camera for use with roll film having a perforation for each film frame employs a film transporting member

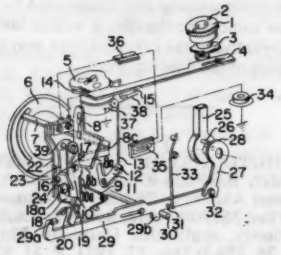
which is held against rotation by an arresting device in response to completed transport of film by the length of a frame. The arresting device is rigid with a tracking member which is normally biased against the film by a driver wheel to enter an oncoming perforation upon completed transport of the film by the length of a frame whereby the tracking member actuated the arresting device. The latter carries a projection which maintains the camera release in its starting position when the transporting member is free to advance the film. The driver wheel is biased by a first spring against a blocking pawl which can be disengaged in response to movement of camera release from its starting position whereby the spring propels the driven wheel to a position in which a second spring is free to withdraw the tracking member from the adjacent perforation and a gear segment of the driver wheel meshes with a gear on the transporting member so that the latter can rotate the driver wheel back into engagement with the blocking pawl during transport of the film with attendant stressing of the first spring. The driver wheel further serves to open the shutter, to index a socket for a flashcube and/or to actuate an impeller which fires a flash lamp of the flashcube in open position of the shutter.

3,714,878

SINGLE-LENS REFLEX CAMERA HAVING INTERCHANGEABLE LENSES

Goro Hasegawa, Fuchu-shi, Tokyo, and Yukio Iura, Kawasaki-shi, Kanagawa-ken, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1970, Ser. No. 93,787
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **5 Claims**



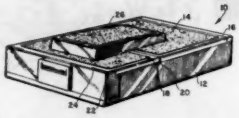
A single lens reflex camera having interchangeable lenses, an exposure meter capable of carrying out photometering of the light through a phototaking lens according to the system of the lens attached. A sliding cam plate is movable to a position corresponding to a preset value of a diaphragm aperture by the engagement of an interchangeable lens with a preset pin. A rocking lever is engageable with the sliding cam plate for positioning at a predetermined location in accordance with the location of the preset pin for adjusting the exposure meter to open aperture photometry, and a sliding member is operatively engageable with an aperture setting pin of the lens. A setting lever is connected to the sliding member for setting the aperture to a preset value, a portion of the setting member being engageable with the rocking lever when the setting lever is actuated to set the exposure, thereby to pivot the rocking lever for adjusting the exposure meter to open aperture photometry. A warning member in operative association with the rocking lever is movable between a warning range and a photometry range.

3,714,879

REFLEX CAMERA

Edwin H. Land, Cambridge; Igor Blinow, Millis, and Vaito K. Eloranta, Needham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed April 16, 1971, Ser. No. 134,733
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **44 Claims**



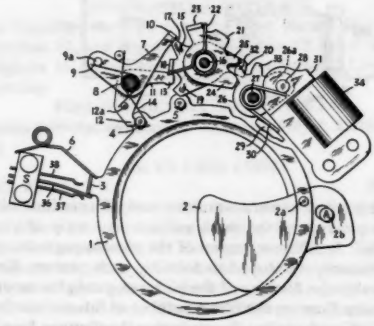
A fully automatic single-lens reflex camera configured to be foldable into a thin, compact shape suited for convenient carrying in the pocket of a garment. Thinness is achieved through a placement of a motor source adjacent one side of a rectangular film cassette within the housing of the camera and a roll-type processing station adjacent an opposite side of the cassette. A gear train having two branch circuits is coupled within the camera housing between the motor and the processing station along a third side of the film cassette. Reflex operation of the camera is carried out in response to movement of a kinematic linkage including a ram extending along the length of the elongate gear train. Through selective dual energization of the motor, this reflex operator assembly is moved by the kinematic linkage between viewing and exposure positions.

3,714,880

ELECTRIC SHUTTER OPERATING MECHANISM

Kiyoshi Kitai, 54 Tomihisa-cho, Tokyo, Japan

Filed Sept. 24, 1971, Ser. No. 183,478
Claims priority, application Japan, Sept. 25, 1970, 45/83,484
Int. Cl. G03b *9/22*
U.S. Cl. 95—63 **9 Claims**



A shutter operating mechanism comprises three rotary driving members. The first and second driving members are coaxial and are coupled by a first driving spring. The first driving member opens the shutter by movement in one direction from a cocked position and closes the shutter by further movement in the same direction. The third

driving member is biased in a direction to close the shutter by a second driving spring and is held against such bias by the armature of an electromagnet when energized. The second and third driving members are coupled by modified gear teeth so that, in cocked condition the second driving member biased by the first driving spring acts on the third driving member to hold the armature against the unenergized electromagnet. At the end of the opening movement, the residue force of first driving member is dissipated by being directed from the second driving member to the third driving member in an approximately radial direction by the gear teeth. Upon release of the third driving member by the electromagnet, rotation of the third driving member by the second driving spring is transmitted through the gear teeth to the second driving member and hence to the spring-coupled first driving member to close the shutter.

3,714,881

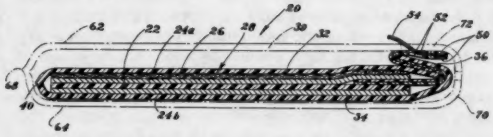
SINGLE USE FILM DEVELOPER AND RUPTURABLE SEAL THEREFOR

James F. G. Bowlby, 124 Demarest Road, Bloomingdale, N.J.

Filed Oct. 5, 1970, Ser. No. 77,778

Int. Cl. G03d *3/00*

U.S. Cl. 95—89 R **18 Claims**



Light-sealed holder means are disclosed for releasably packaging a length of film. The light seal of the film holder which is readily rupturable is made by heat sealing a folded over corner of the plastic that forms the holder.

3,714,882

APPARATUS FOR DEVELOPING EXPOSED LIGHT-SENSITIVE SHEETS

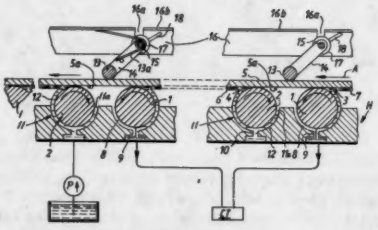
Karl-Wilhelm Schranz, Opladen; Wolfgang Hunicke, Leverkusen, and Josef Busch, Bensberg, all of Germany, assignors to Agfa Gevaert Aktiengellschaft, Leverkusen, Germany

Filed June 25, 1971, Ser. No. 156,840

Claims priority, application Germany, June 26, 1970, P 20 31 648.7

Int. Cl. G03d *5/06*

U.S. Cl. 95—89 R **19 Claims**



A developing apparatus for light sensitive emulsions at the undersides of sheets which are transported in a horizontal plane has alternating liquid applying and liquid removing rollers which respectively coat the undersides of sheets with layers of a liquid developer and remove such layers from the sheets. The sheets are biased against the rollers by idler rollers which rest by gravity on the upper sides of the sheets. The liquid applying and liquid removing rollers rotate in opposite directions at peripheral speeds which exceed the forward speed of the sheets by at least 10 percent.

3,714,883

MACHINE FOR WET TREATMENT OF ELONGATED STRIP-SHAPED CARRIERS FOR LIGHT SENSITIVE MATERIAL

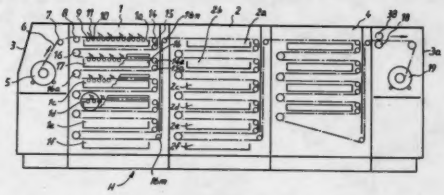
Wolfgang Hunicke; Rolf Spohr, both of Leverkusen; Karl-Wilhelm Schranz, Opladen; Josef Busch, Bensberg; Erwin Schon, Leverkusen, and Hans-Dieter Frick, Munich, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 28, 1971, Ser. No. 157,572

Claims priority, application Germany, June 26, 1970, P 20 31 649.8

Int. Cl. G03d *3/12, 5/06*

U.S. Cl. 95—94 R **13 Claims**



A machine for repeated wet treatment of exposed film strips or the like with one or more liquids has one or more stacks of superimposed treating sections wherein the film strips advance in horizontal planes so that their emulsion-coated sides face downwardly. Each section contains liquid applying rollers which dip into supplies of liquid treating agents and contact the undersides of the travelling film strips. The liquid applying rollers alternate with liquid removing rollers which remove the layers of liquid applied by the preceding liquid applying rollers and direct the thus removed liquid into channels for evacuation from the machine. The film strips are pulled by advancing rolls which are mounted downstream of the last treating section, and the liquid applying and liquid removing rollers are driven in opposite directions to respectively brake and accelerate the adjoining portions of the strips. This insures that the tension of film strips cannot increase to a value at which the strips would be likely to tear or to slip off their guide rollers.

3,714,884

DEVICE FOR VENTILATION SYSTEMS IN SPACES

Tore Christiansen, Bandhagen, Sweden, assignor to Carl George Munters, Stocksund, Sweden

Filed July 1, 1970, Ser. No. 51,620

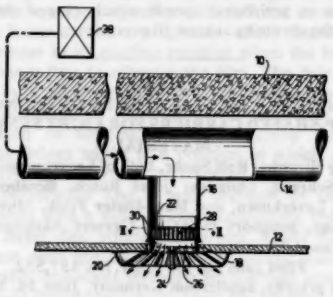
Claims priority, application Sweden, July 11, 1969, 9910/69

Int. Cl. F24f *13/06*

U.S. Cl. 98—40 D **7 Claims**

A device in a ventilation system for spaces and comprising a channel for admitted air opening into said spaces and housing a throttling member occupying at least almost the entire cross-

sectional area of the channel and composed of mutually parallel thin layers subdividing said throttling member into a great



number of tubular straight passages with a so small diameter as effectively to counteract occurrance of disturbing noise.

3,714,885

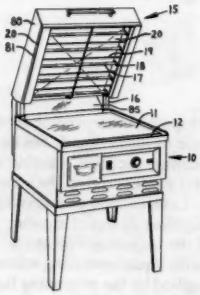
BROILER-GRILL COOKING APPLIANCE

Donald J. Wertheimer, Milwaukie, Oreg.; Richard D. Fish, Bellevue, Wash., and Ralph A. Holmes, Portland, Oreg., assignors to F. S. Manufacturing Company

Filed Oct. 15, 1971, Ser. No. 189,548

Int. Cl. A47j *37/06*

U.S. Cl. 99—425 **14 Claims**



A griddle unit forms a base for a hinged hood containing a broiler unit whereby meat, fish and other products may be cooked very rapidly and efficiently by grilling them on the bottom and simultaneously broiling them on the top. The source of heat for the broiler is a plurality of tungsten filament quartz tube lamps mounted beneath a reflector plate. Counterbalancing springs in supporting hollow stanchions assist in raising the hood and a spring catch positioner holds the hood open at a 60° angle for normal use or in vertical position for use of the griddle without the broiler. The broiler is energized only when it is brought down into horizontal broiling position above the griddle. A grease trough along the front of the griddle discharges into a grease pan in the base which is enclosed in a slide housing to prevent overflow into the base of the appliance. An accordion-folded spring plate presses electric heating elements into good heat conducting relation with the under side of the griddle plate for efficient heating of the griddle.

3,714,886

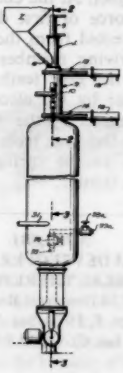
MEANS AND METHOD OF PRODUCING AN EXPANDED CEREAL PRODUCT

William W. Worden, P.O. Box 98, Thermal, Calif.

Filed March 15, 1971, Ser. No. 123,999

Int. Cl. A23l *1/18*

U.S. Cl. 99—467 **7 Claims**



A means and method whereby bulk cereal is fed intermittently into an entrance chamber, steam pressurized and gravity fed into an elongated vertical superheated and pressurized steam chamber where the individual grains separate as they fall by gravity for intimate contact by super-heated steam to effect localized condensation of the steam and moisture impregnation. The grains being collected at the bottom of the steam chamber and subjected to continuous agitation and continuous extrusion to atmospheric pressure with attendant expansion in the course of discharge.

3,714,887

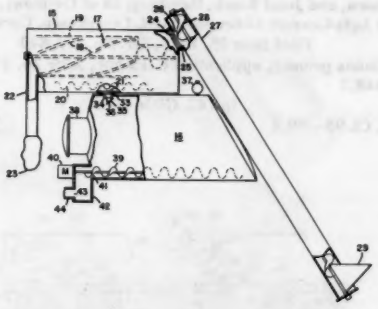
APPARATUS FOR CRUSHING FRUIT IN AN INERT GAS

Wallace J. S. Johnson, Berkeley, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 65,576, Aug. 20, 1970, abandoned. This application Nov. 18, 1971, Ser. No. 107,176

Int. Cl. A23l *1/02*

U.S. Cl. 99—239 **12 Claims**



An enclosed fruit-crusher, discharging into an enclosed tank filled with an inert gas, which, as it is filled with crushed fruit, displaces the inert gas from the tank through the crusher and out the crusher inlet, thereby preventing entry of oxidizing air into the crusher or tank at all times during filling and crushing. Inert gas under pressure is introduced into the tank as crushed fruit is discharged therefrom, thereby refilling the tank with inert gas and preventing contact of the crushed fruit with oxidizing air during emptying.

3,714,888

MACHINE FOR COOKING EGGS AND MINCED MEATS

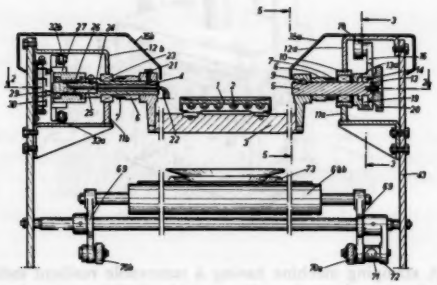
Pierre Tanguy, 19 rue de France, 95 S'Ouen P'Aumoue; Pierre Carre, 58 rue Y. Tonnjuene, P. 78 Bongival, and Jean Le Boulbouech, 6 rue Blangin, Lorient, all of France

Continuation-in-part of Ser. No. 764,825, Oct. 3, 1968, abandoned. This application March 19, 1971, Ser. No. 125,997

Claims priority, application France, March 25, 1968, 68145315

Int. Cl. A47j *27/14*

U.S. Cl. 99—355 7 Claims



An automatic cooking machine for restaurants, canteens, etc., comprises a line of cooking slabs movable in a closed vertical circuit and carrying the food to be cooked. Each of the slabs is pivotable about a horizontal axis transverse to the direction of movement of the slabs and displaced from the center of the slab in the direction of movement of the slab so that by turning a slab over, food can be transferred to an adjacent slab. Means is provided for applying heat to cook the food on the slabs and for delivering the cooked food onto service plates at another point of the circuit.

3,714,889

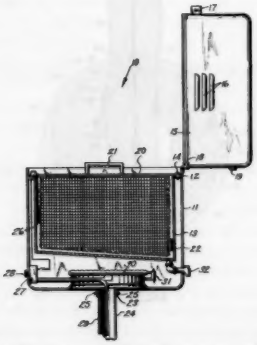
OUTDOOR DEEP FRYER

Russell E. Mazzola, 1702 18th Street, Phenix City, Ala., and Nicola J. Fucci, 3934 Commander Drive, Columbus, Ga.

Filed March 4, 1971, Ser. No. 120,937

Int. Cl. A47j *37/12*

U.S. Cl. 99—411 5 Claims



An apparatus for outdoor frying of foods. This device includes a pipe stand with a casing attached to it, containing a pot member with a removable wire basket. The apparatus also includes heat control means for the gas or electric heating arrangement.

3,714,890

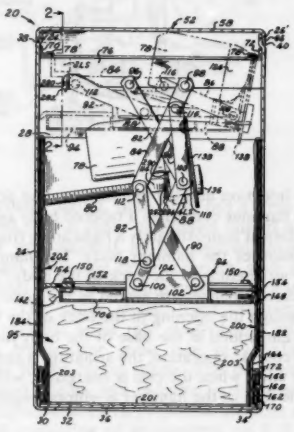
REFUSE COMPACTOR

Jerry W. Moon, 2735 Alveston, Bloomfield Hills, Mich.

Filed June 1, 1971, Ser. No. 148,879

Int. Cl. B30b *15/06*

U.S. Cl. 100—229 A 26 Claims



A refuse compactor including a receptacle removably contained within a cabinet wherein refuse is compacted by a ram to a fraction of its normal volume. The refuse is compacted within a specially constructed bag supported by the receptacle and cabinet, permitting the compacted refuse to be removed as a wrapped package for convenient and tidy disposal. The ram includes a refuse-compressing platen actuated through a toggle linkage to which force is applied by a single screw driven by an electric motor coupled to the screw through a reduction drive. The screw and its motor drive train are carried as a unit by the toggle linkage and move bodily therewith to provide a very compact and high ratio force multiplication system of reliable and inexpensive construction. Additional features relating to control circuitry, a safety lock, and bag, receptacle and drawer construction are also disclosed.

3,714,891

PROCESS OF USING MULTI-PURPOSE LITHOGRAPHIC SOLUTION

Charles H. Van Dusen, Jr., Willoughby, and Paul Brown, Cleveland, both, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 8, 1970, Ser. No. 96,274

Int. Cl. B41m *1/00, 5/00;* B41n *3/00*

U.S. Cl. 101—451 2 Claims

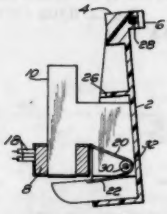
A multi-purpose lithographic solution is provided adapted for use in concentrated form and in different ratios of aqueous dilution as conversion, start-up, fountain solution, or the like for a plurality of different types of planographic printing masters, such as electrostatic, direct-image, and photographic planographic masters, both projection speed and conventional. The solution preferably comprises glycerin, monosodium phosphate, potassium ferrocyanide, and water as solvent. The amounts of the dissolved components in the concentrated form must be present within fairly narrow ranges. Similarly, when the concentrated solution is diluted for use, for example as a fountain solution, the dilution with water must be carried out in definite ratios of concentrated solution to water.

3,714,892

IMPACT HAMMER FOR LINER PRINTER

Richard Anthony Perry, Attleboro, Mass., assignor to Odec Computer Systems, Inc., East Providence, R.I.

Filed Oct. 20, 1970, Ser. No. 82,355
Int. Cl. B41j *9/38*
U.S. Cl. 101—93 C 3 Claims



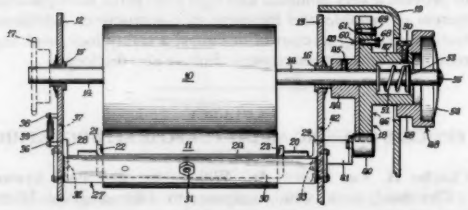
A plastic injection molded hammer for line printers is disclosed. The hammer comprises a tapered body and a hammer head projecting at approximately a right angle from the logitudinal dimension of the hammer body. The hammer body is hollow with an opening in the back of the body. The coil and core of an electromagnet are seated in the hollow portion of the body through the opening in the back of the body and an armature is embedded in the base of the body directly below the coil and core. In operation, the armature is attracted to the coil and the core, when the coil is energized, with such great force that the face of the hammer is whipped against the print anvil.

3,714,893

ROTARY LABEL PRINTING MACHINE WITH ADJUSTABLE ROTOR CAM FOR SEPARATING THE PRINTING COUPLE

Jean R. Cole, Des Plaines, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed March 15, 1972, Ser. No. 234,850
Int. Cl. B41f *13/34*
U.S. Cl. 101—228 4 Claims



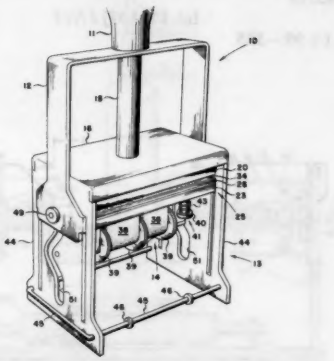
A label printer having a printing roller and a cooperative platen roller which together act to print a label and feed label stock through the printer. An adjustable cam having plural discs is associated with the printing roller to move the platen roller away from its cooperative engagement with the printing roller during selected portions of the roller circumference to cause an intermittent feeding of label stock. One disc of the adjustable cam includes two arcuate concentric rows of spaced apart apertures with the apertures of one row regularly intercalated with the apertures of the adjacent row. Fine cam adjustment is accomplished by relative rotation of the plural discs of the cam and a pin locking of the discs in their adjusted position.

3,714,894

RECIPROCATING HANDSTAMP WITH MAGNETIC PLATE HOLDING MEANS FOR REMOVING THE PLATE

Gerald P. Robinson, 1940 North Atlanta Rd., Apt. 13B, Smyrna, Ga.

Filed Dec. 3, 1970, Ser. No. 94,916
Int. Cl. B41f *27/02*; B41k *1/06*
U.S. Cl. 101—382 MV 4 Claims



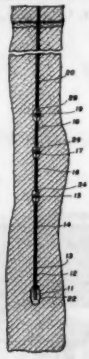
A stamping machine having a removable resilient indicia bearing member adapted to imprint indicia upon desired receiving locations. The indicia bearing member is affixed to a saddle which is removably attached to the machine type carrying bed by means of magnetic attraction. A release plunger mounted on the type carrying bed detaches the saddle at predetermined times. Alignment and registry of the stamping machine with the item to be stamped is done by aligning integral indexing devices with index points on the indicia bearing member and desired points on the item to be imprinted. Two methods for proper alignment and registry are shown.

3,714,895

METHOD FOR EXCAVATING BY EXPLOSIONS

Donald E. Rawson, Del Mar, Calif., assignor to Gulf Oil Corporation

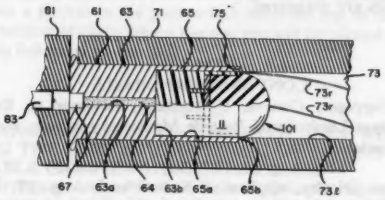
Filed Jan. 13, 1970, Ser. No. 2,481
Int. Cl. F42d *1/00*
U.S. Cl. 102—23 7 Claims



A method for excavating by means of explosions is described wherein two or more explosive devices or charges are placed at selected depths and relative distances and are detonated with a predetermined time relationship. Various

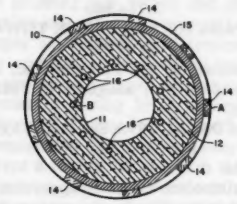
charge positions and detonation timing patterns are described for producing explosions in which the effects of one explosion are enhanced by the other in order to achieve excavations having desired configurations.

3,714,896
PROJECTILE, CARTRIDGE, AND METHOD
Robert B. Young, Jarrettsville, Md., assignor to AAA Corporation, Cockeysville, Md.
Filed Dec. 31, 1970, Ser. No. 103,111
Int. Cl. F42b *5/22, 9/20*
U.S. Cl. 102—41 **13 Claims**



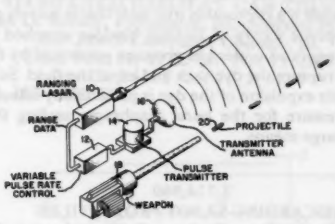
An incapacitating or disabling projectile and method of forming such, including a longitudinally thick-based plastic cup having a forward open cavity with a soft resilient nose therein, and a weight slug secured in radially symmetrical relation within the cup cavity and at substantially the longitudinal center of mass of the cup and nose. The soft resilient nose mass is injected into the plastic cup and a forwardly extending mold cavity, and cured or otherwise set in situ in the plastic cup. The projectile is launched from a cartridge employing a charge of ignitable propellant powder for propulsion.

3,714,897
DIRECTED WARHEAD
Leland L. Parker, Corona, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Apr. 4, 1968, Ser. No. 720,436
Int. Cl. F42b *1/02*
U.S. Cl. 102—56 **9 Claims**



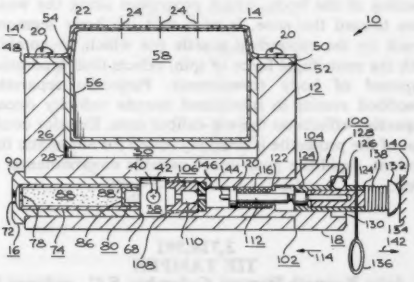
A warhead containing a liquid or plastic explosive is forced into a desired shape to give directional effect to the explosive for directing the major warhead blast towards a target.

3,714,898
FUZE ACTUATING SYSTEM
Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company
Filed July 22, 1969, Ser. No. 843,478
Int. Cl. F42c *11/04*
U.S. Cl. 102—70.2 R **7 Claims**



An electronic, digital, time fuze, has a time base which is introduced over a radar command link at a rate which is inversely proportional to the desired projectile flight time. A target following ranging device, such as a ranging laser, provides target range information to a pulsed radar transmitter. The range signal from the ranging device controls a variable pulse rate control unit which in turn adjusts the transmitter pulse rate to a value inversely proportional to the target range. The transmitter is fixed to the weapon system and radiates in the direction of the projectile flight path. Each projectile includes a fuze actuating circuit consisting of an antenna, an R.F. detector, a fixed-set counter and a firing circuit. At launch, the fuze actuating circuit within each projectile becomes actuated a short distance after departure from the gun muzzle. As the projectile travels towards its target it receives a series of R.F. pulses at a rate which will just fill the counter when the projectile is at the proper range. The counter within the fuze counts the pulses received during its flight to target. When the fixed-set number has been accumulated, the firing circuit detonates the payload.

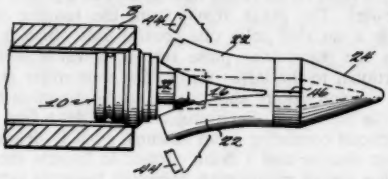
3,714,899
SCORING MODULE
Ernest A. Filippi, Northridge, Calif., assignor to Special Devices, Inc.
Filed July 1, 1970, Ser. No. 51,653
Int. Cl. F42b *13/42*
U.S. Cl. 102—90 **9 Claims**



An improved scoring module for a weapons training aid for producing noise and/or smoke and/or a flash for simulating an explosive and providing the expulsion of a marking dye for simulating the effect of shrapnel-type hits. The scoring module is adaptable to any type of simulated weapons training aid that

may be desired for utilization in realistic simulated combat training procedures. The scoring module is reusable and is designed for field refurbishing after each use. A single noise, smoke and gas generating cartridge means is utilized to provide both the gas pressure for expelling dye as well as the simulated noise, smoke and flash. The primer system is mechanically actuated by either a lanyard pole or a bore rider. Both the gas generator cartridge and the ignition means are replaceable units in the body member and the marking dye is contained within a a rupturable dye sack that is merely placed in the appropriate cavity. A flexible bladder attached to the body means operates under gas pressure generated by the gas generator to rupture the dye sack and expel the fluid. Substantially complete expulsion of the dye is provided by selection of the burst pressure for the burst diaphragm sealing the gas generator charge means.

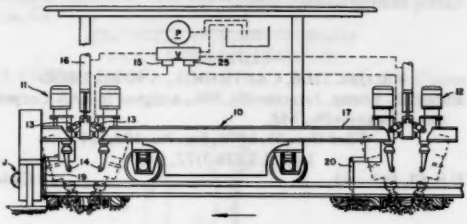
3,714,900
DISCARDING SABOT PROJECTILES
Fritz K. Feldmann, Santa Barbara, Calif., assignor to Pacific Technica Corporation, Santa Barbara, Calif.
Filed Aug. 29, 1969, Ser. No. 854,095
Int. Cl. F42b *13/16*
U.S. Cl. 102—93 **7 Claims**



A discarding sabot projectile of novel construction is provided whereby separation of the components is accomplished by the combined effect of centrifugal force and the impingement of muzzle gases from the exhausting gun barrel. The sabot preferably comprises a metallic base incorporating means to impart spin to the projectile, and a plastic body firmly surrounding and supporting a sub-caliber core so that the longitudinal axis of the sub-caliber core is coincident with the axis of the full caliber projectile. The plastic body includes a plurality of longitudinally extending slots, or similar weakening lines, beginning at the rear of the plastic body and extending forward toward the tapered nose. Immediately after discharge from the muzzle, the sabot body starts to separate into symmetrical segments, beginning at the rear of the body, under the centrifugal force of projectile spin. The further opening of the body, which progresses along the weakened lines toward the nose, is such that the body segments are struck by the expanding muzzle gas which, in combination with the centrifugal force of spin, effects final separation and dispersal of body components. Projectile separation as described results in minimized muzzle velocity decay and dispersing effects on the sub-caliber core. Exterior configuration of the projectile is uniquely suited for automatic firing in modern, rapid-fire guns under variable environmental conditions.

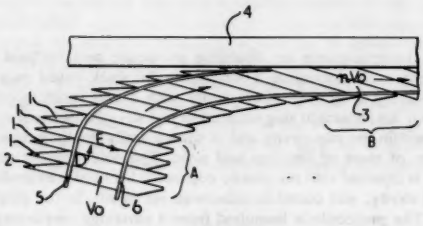
3,714,901
TIE TAMPER
John Kenneth Stewart, Columbia, S.C., assignor to Canron, Inc., Phillipsburg, N.J.
Filed Oct. 12, 1970, Ser. No. 79,773
Int. Cl. E01b *27/16*
U.S. Cl. 104—12 **5 Claims**

The invention relates to a method and to an apparatus in which a railroad track tamping machine having front and rear tamping heads can operate with a relatively small power supply because the operation of the front and the



rear tamping heads is so sequenced that their peak power demands are staggered.

3,714,902
CONVEYOR HANDRAILS
Paul Zuppiger, Geneva, Switzerland, assignor to Dunlop Holdings Limited and Battelle Memorial Institute, Geneve, Switzerland
Filed Aug. 24, 1971, Ser. No. 174,426
Claims priority, application Switzerland, Aug. 27, 1970, 12795/70
Int. Cl. B65g *17/06*
U.S. Cl. 104—25 **36 Claims**

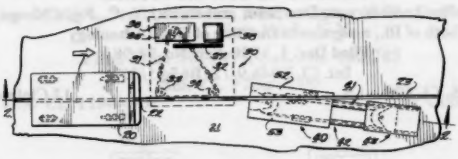


A variable speed handrail for a conveyor in which a series of relatively slidable overlapping elements provides a load bearing surface in the edge regions. The elements may slide transversely or slide in other directions simultaneously with a change of inclination. The handrail may follow a curved or straight path and a constant depth handrail is provided. The relative sliding is controlled by guide means and drive means are provided as well as positive means for maintaining the elements in mutual contact, of which the following is a specification.

3,714,903
TAKEUP APPARATUS FOR TRUCK TOW CONVEYOR SYSTEM
Chester A. Rosenberger, Jr., Perkasie, Pa., and Horace M. Swartz, Doylestown, Pa., assignors to FMC Corporation, San Jose, Calif.
Filed Dec. 31, 1970, Ser. No. 103,096
Int. Cl. B65g *23/60*
U.S. Cl. 104—196 **21 Claims**

This invention involves a takeup apparatus for an endless chain in a materials handling truck tow conveying system. In particular, the endless chain operates in a shallow depth guideway immediately below the surface on which the truck operates, and spaced pusher-links in the chain engage a tow pin on the truck to propel the truck. In the takeup section, which is independent of the chain drive, the endless chain is trained around a horizontal adjustable sprocket, then backwards under the incoming section of the chain to an inclined fixed idler sprocket from which the outgoing section

of chain is redirected in a straight line continuation of the original direction of the incoming chain section. At the truck tow pin transfer area, the incoming and outgoing chain sections are parallel and adjacent to each other with the outgoing



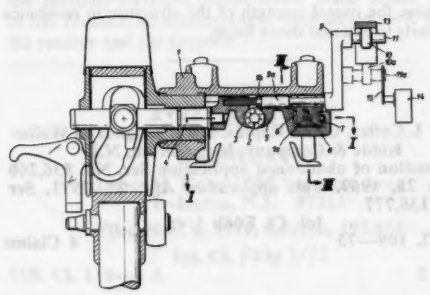
section slightly depressed in elevation so the tow pin can slide out from a pocket in the pusher-link onto the top of the adjacent section of chain where the tow pin will be picked up by a closely following pusher-link.

3,714,904

ARRANGEMENT FOR AUTOMATICALLY TESTING THE GRIP OF GRIPPING JAW MEANS OF CABLE CARS ON A TENSION CABLE

Hans Bruggemann and Rudolf Kulzer, Cologne, Germany, assignors to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft, Cologne-Zollstock, Germany

Filed July 26, 1971, Ser. No. 165,896
Int. Cl. B61b *7/20, 11/02*
U.S. Cl. 104—202 **4 Claims**



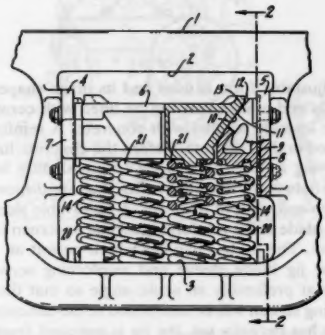
The arrangement is intended for use in a cableway which comprises an endless tension cable operable to revolve in an endless path, and a plurality of cars each of which comprises gripping jaw means and means for operating said gripping jaw means to grip said tension cable and thus to couple said car to said tension cable. The cableway further comprises a shut-down switch operable to interrupt the operation of said tension cable. The arrangement comprises a testing lever carried by each of said cars, a testing rail disposed in the path of said testing lever and engageable thereby and adapted to apply to said testing lever a testing force which tends to impart to said testing lever a pivotal movement in a predetermined sense, and means operatively connecting said testing lever to said gripping jaw means and arranged to present to said pivotal movement a resistance depending on the grip of said gripping jaw means on said tension cable. The testing lever is arranged to operate said shut-down switch when said force has overcome said resistance. The arrangement further comprises compression spring means, a weighing rail which is subjected to an upward bias by said compression spring means and adapted to be engaged at its top by each car and to be depressed to an extent which depends on the weight of said car, and multi-position switch means adapted to control said testing force in dependence on the extent of the depression of said weighing rail by said car.

3,714,905

DAMPENED RAILWAY CAR TRUCK

Franklin D. Barber, Flossmoor, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

Filed Feb. 16, 1971, Ser. No. 115,184
Int. Cl. B61f *5/06, 5/12, 5/24*
U.S. Cl. 105—197 DB **5 Claims**



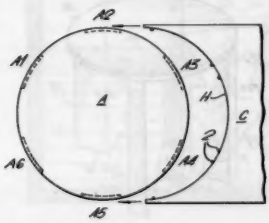
A dampened bolster and side frame assembly for a railway truck including widened lands on the side frame and a plurality of spaced wedges on each side of the bolster and on opposite sides of the frame center line.

3,714,906

TABLE UNITS

Paul Ian Finestone, 20, Sheldon Avenue, Highgate, London, N.6., England

Filed Feb. 8, 1971, Ser. No. 113,315
Claims priority, application Great Britain, Feb. 12, 1970, 6,816/70
Int. Cl. A47b *7/00*
U.S. Cl. 108—64 **14 Claims**



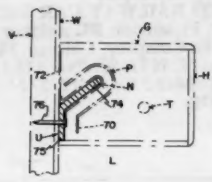
A system of table units comprising one or more basic units of circular form and auxiliary units whose peripheral shape includes a concavity of the same curvature as the basic unit and means for effecting edge-to-edge releasable connection of said main and auxiliary units.

3,714,907

CERAMIC TILE SHELF AND FORM FOR MAKING IT

Roy E. Michieli, 545 Begier Avenue, San Leandro, Calif.

Filed Dec. 9, 1970, Ser. No. 96,521
Int. Cl. A47b 5/00
U.S. Cl. 108—152 **2 Claims**



An adjustable form is used and its prism-shaped space has four walls and a base that can be lined with ceramic tile and then the interior is filled with concrete. A reinforcing bar is embedded in the concrete. Before the concrete has set a jig is used having a blade that has a length slightly less than the distance between the ceramic tiles that are disposed adjacent to the two end walls of the form. A removable sleeve is placed over the blade and a reinforcing screen or screen lath encloses the sleeve. The jig has handles which permit an operator to force the jig blade sleeve and reinforcing screen into the concrete at preferably an acute angle so that the sleeve and reinforcing screen will be embedded in the concrete. After the concrete has partially set, the jig is removed from the sleeve and when the concrete has completely set, the completed ceramic tile shelf is freed from the form.

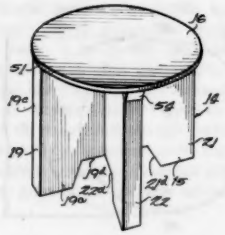
A hanger can be secured to a wall or other vertical surface and the hanger will have a flat portion that extends upwardly and at an acute angle with the vertical surface. The operator takes the shelf and attaches it to the hanger by permitting the inclined portion of the hanger to enter the sleeve. The weight of the shelf will hold it in place and the inclination of the hanger flat portion will keep the shelf in contact with the supporting wall surface due to gravity.

3,714,908

FIBER BOARD TABLE

Michael F. Notko, Riverside, Ill., assignor to Druth Packaging Corp., Chicago, Ill.

Filed April 19, 1971, Ser. No. 135,014
Int. Cl. A47b 3/06
U.S. Cl. 108—157 **6 Claims**



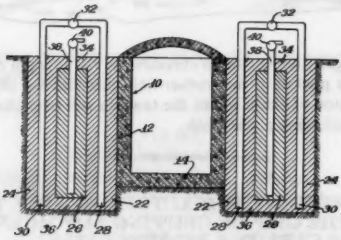
A fiber board table includes a generally horizontal top and an elongated generally vertically extending base for supporting the top. The base is formed from a single sheet of fiber board which is provided with spaced-apart fold lines to permit the base to be folded to provide a plurality of legs which extend radially outwardly from the central axial portion of the base. The sheet includes tab means adjacent the lower end thereof for interconnecting the spaced-apart walls of each leg, and the top includes downwardly extending tab means for connecting the top to the base and for reinforcing the upper end of the legs.

3,714,909

SYSTEM FOR INCREASING THE SHOCK LOADING RESISTANCE OF STRUCTURES

Philip J. Anderson, Deerfield, and Daniel Y. C. Ng, Chicago, both of Ill., assignors to Institute of Gas Technology

Filed Dec. 1, 1970, Ser. No. 93,981
Int. Cl. E04h 9/12; B65g 5/00
U.S. Cl. 109—1 S **12 Claims**



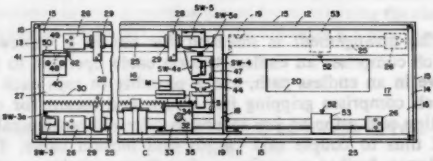
A reinforced underground structure and a method for constructing the same. A below ground chamber or excavation is surrounded and defined by a concrete support wall. A frozen earthen formation surrounds the concrete wall. Preferably, the frozen zone includes an inner frozen zone which is adjacent the concrete wall, an outer frozen zone which is spaced from the inner frozen zone, and an intermediate confined zone is frozen under a preselected internal compressive stress so as to increase the overal strength of the structure in resistance particularly to external shock loads.

3,714,910

VAULT AIR VALVE

Larry I. Cutter, Cedar Rapids, Iowa, assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Continuation of abandoned application Ser. No. 836,260 June 25, 1969. This application Apr. 29, 1971, Ser No. 138,777
Int. Cl. E06b 3/46
U.S. Cl. 109—73 **4 Claims**



A closable air inlet assembly, often known as a "vault air valve," for ventilating a bank vault or the like is disclosed. The assembly features a horizontally sliding, door-like closure which is suspended in such manner that, even when the assembly is placed in the floor, ceiling or side wall of a vault, the heavy door may be readily slid open or closed by a relatively small electric motor. The door is normally opened and closed from an electrical control panel within the vault, and a solenoid activated latch positively maintains the door in its closed position. An auxiliary electrical control panel is disposed outside the vault but is capable only of closing the door. A hand wheel is

included within the vault so that the door may be manually closed, but not opened, in the event of power failure.

3,714,911

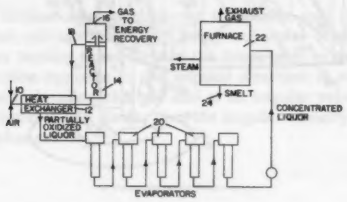
METHOD OF TREATMENT OF ALKALINE PULPING BLACK LIQUORS BY WET AIR OXIDATION

Louis A. Pradt, Wausau, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 10, 1971, Ser. No. 122,787

Int. Cl. F23g 7/00

U.S. Cl. 110—7 R 2 Claims



Wet oxidation and evaporation of alkaline pulping black liquor by approximately a fifty percent oxidation, e.g., evaporating two pounds of water per pound of air, without the use of conventional evaporators, and passing the partially oxidized concentrated black liquor directly to the furnace, or interposing a flash steam tank between the reactor and the furnace.

3,714,912

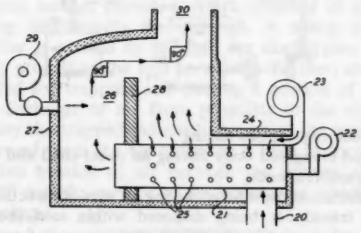
INCINERATOR

James M. Kehoe, 205 Vermont Ave., Irvington, N.J. 07111

Filed Nov. 4, 1971, Ser. No. 195,664

Int. Cl. F23g 5/12

U.S. Cl. 110—8 A 5 Claims



An incinerator wherein there is a primary and a secondary combustion chamber. The output of the primary combustion chamber discharging into a perforate sleeve in the secondary combustion chamber; a portion of the secondary combustion chamber surrounds the sleeve; a blower discharging air in the secondary combustion chamber, in a direction transverse to the direction of movement of gaseous combustion products, whereby the rate of flow of products of combustion is related.

3,714,913

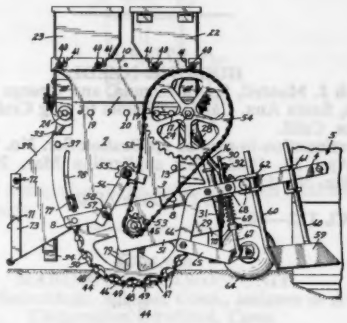
CHEMICAL APPLICATOR ASSEMBLY FOR A ROW CROP PLANTER

Ebenhard S. Gandrud, P.O. Box 528, Owatonna, Minn.

Filed Dec. 7, 1970, Ser. No. 95,501

Int. Cl. A01c 7/18

U.S. Cl. 111—73 5 Claims



Apparatus having means for attachment to a mobile agricultural implement and arranged to apply chemicals to the earth. The apparatus includes a rotary incorporating wheel engaging the ground adjacent chemical applicators and operating to incorporate the chemicals with the earth material above planted seed for the purpose of preventing growth of weeds and injurious insects.

3,714,914

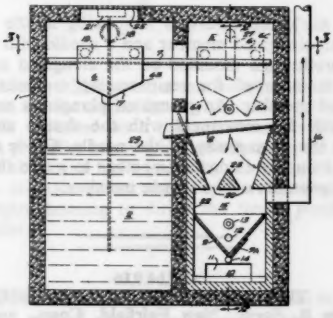
SEWAGE DISPOSAL DEVICE

William E. Dorn, R.R. 1 Box 72 F, Miami, Fla.

Filed Jan. 27, 1971, Ser. No. 110,133

Int. Cl. F23g 5/12

U.S. Cl. 110—8 R 6 Claims



A sewage disposal device operative to separate solids from liquids in raw sewage and completely incinerate the solids and treat the fluids to eliminate pollution at the source of the sewage is described. A separation and filtration bucket moveable between a settling chamber for containing fluids and a combustion chamber, receives intermittent charges of of raw sewage for filtration and drainage into the fluid separation chamber and transportation and depositing of the remaining

solids into the combustion chamber for drying out and complete incineration of the solids for subsequent removal as inert ash. Means is provided for further treatment of the separated liquid sewage to render it substantially pollution-free effluent.

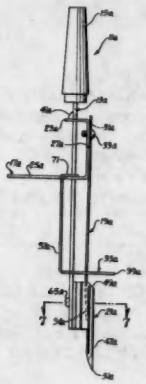
ERRATUM

For Class 111—73 see:
Patent No. 3,714,913

3,714,915
HOOKING NEEDLE

Joseph J. Montell, South Laguna, and George L. Houghton, Santa Ana, Calif., assignors to Rug Crafters, Santa Ana, Calif.

Continuation-in-part of application Ser. No. 722,349, Apr. 18, 1968. This application Mar. 29, 1971, Ser. No. 128,699
Int. Cl. D05c *15/06*
U.S. Cl. 112—80 **9 Claims**



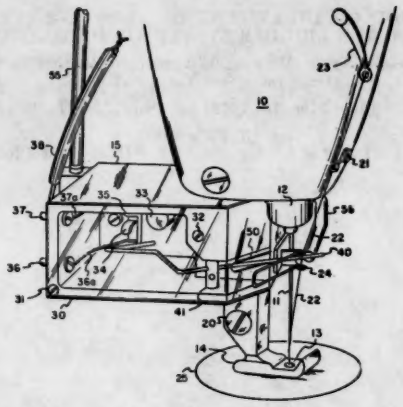
This disclosure describes a hooking needle which includes an elongated member and a needle with a passageway therethrough mounted on the elongated member. A shuttle is mounted for reciprocating movement on the elongated member. An elongated plunger is mounted on the shuttle for movement with the shuttle and extends through the passageway of the needle. Guide means are mounted on the elongated member to guide the reciprocating movement of the tongue member.

3,714,916
THREAD MONITORING DEVICE

George B. Saray, New Fairfield, Conn., assignor to Ivanhoe Research Corporation, New York, N.Y.

Filed Mar. 27, 1968, Ser. No. 716,604
Int. Cl. D05b *51/00*
U.S. Cl. 112—218 R **1 Claim**

A sewing machine accessory for mounting onto the sewing machine and there monitoring thread to be presented to the needle of the machine. The device includes a modified thread guide which substitutes for the normal thread guide. The modified thread guide and thread therein cooperate forming an arresting combination for a pivotally mounted biased rod. The rod is biased toward escape from arrest upon absence of thread in the guide, and upon

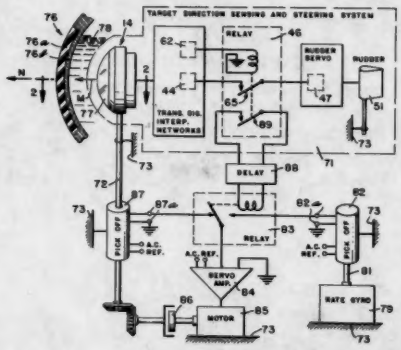


escaping from arrest the rod effectively actuates an indication device.

3,714,917
APPARATUS FOR STEERING A TORPEDO

Dwight L. Supernaw, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 7, 1960, Ser. No. 41,461
Int. Cl. F42b *19/01, 19/06*
U.S. Cl. 114—20 **4 Claims**



1. In a homing torpedo having

a. a rigid elongated body having an outer shell and having front and rear ends,

b. a directional transducer having an axis of directionality, said transducer being disposed within said shell and rotatably carried by the rigid body adjacent its front end,

c. means forming an acoustic window in the frontal surface of the outer shell of the torpedo operatively associated with the transducer to transmit and receive acoustic signals,

d. means operatively associated with said transducer for sending an acoustic signal to a target,

e. means operatively associated with said transducer for receiving an echo-signal returned form the target and for producing an error signal corresponding to the deviation between target and the axis of directionality,

f. steering means controlled by said error signal to change the torpedo heading in a direction tending to restore alignment of the target and the axis of directionality of the transducer, the improvements, in combination, comprising;

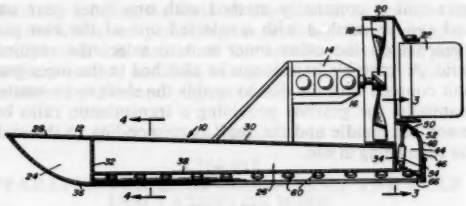
g. means supporting said transducer for rotation solely about a vertical axis of rotation,

h. means rigidly coupled to the torpedo body for sensing the angular velocity at which the torpedo heading changes and for producing a transducer turning signal having an amplitude and signal polarity corresponding to the magnitude and angular direction of said angular velocity, and operable independent of movement of said transducer,

i. a reversible motor drivingly connected to said transducer to turn same about said axis of rotation,

j. and control means connected to operate said reversible motor, said control means being responsive to said transducer turning signal to turn the transducer in an angular direction opposite to the angular direction in which the torpedo heading changes and at an angular velocity proportional to and slower than the angular velocity of heading change.

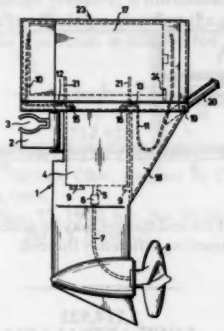
3,714,918
AIR BOAT WITH AIR CUSHION
John Van Veldhuizen, Homestead, Fla.
(Rte. 2, Box 54, Unionville, Tenn. 37180)
Filed July 6, 1970, Ser. No. 52,256
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 A **12 Claims**



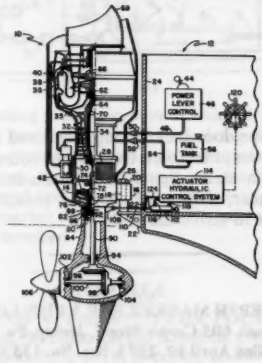
A water surface planing craft including a hull having a bottom surface provided with a plurality of air outlets opening downwardly therethrough. A motor driven air propeller is carried by the hull for discharging air rearwardly propelling the hull forwardly. Further, structure is provided for trapping and ducting a portion of the rearward discharge of air from propeller to the air outlets, whereby the trapped inducted portion of the rearward air discharged from the air propeller is used to form at least a partial blanket of air between the bottom surface of the hull and the surface of the water over which the hull is moving.

3,714,919
OUTBOARD DRIVING DEVICE FOR TOY AND MODEL SHIPS
Max Ernst, Lohengrinstrasse 14, Nuremberg, Germany
Filed Oct. 20, 1970, Ser. No. 82,273
Claims priority, application Germany, Oct. 24, 1969, P 19 53 573.0
Int. Cl. B63h *21/26*
U.S. Cl. 115—17 **2 Claims**

An outboard driving device for toy and model ships, in which an exchangeable dry battery together with an electric motor electrically connectable thereto is located in a housing which is selectively and disengageably connectable to a ship so as to be pivotable about a substantially vertical axis.



3,714,920
MARINE PROPULSION UNIT
Earl O. Setterblade, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Mar. 25, 1971, Ser. No. 127,883
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 R **4 Claims**

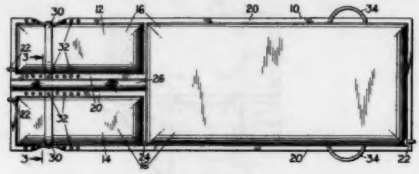


The disclosure illustrates a marine propulsion unit in which a gas turbine engine having a rotatable output shaft is vertically mounted on a pair of trunnions secured to a vessel. A propeller housing is pivotally mounted adjacent the output shaft and has a propeller driven by the output shaft. An actuator pivots the propeller housing relative to the engine housing to direct the thrust produced by the propeller.

3,714,921
WATER FLOAT WITH PADDLE EXTENSION MEANS
Stan Gibson, 2691 E. 49th, Vancouver 3, British Columbia, Canada
Filed Aug. 7, 1970, Ser. No. 61,873
Int. Cl. B63h *1/32*
U.S. Cl. 115—28 R **16 Claims**

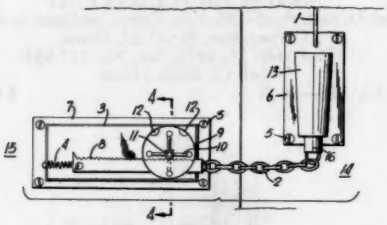
A water float having a buoyant body portion and buoyant rear paddle portions hinged to the body portion. The two rear paddle portions are connected to the body portion by hinge means and have foot straps secured thereto. Upon lying on the float with the feet connected under the foot straps, a person can produce an up and down motion of the paddle portions to

propel the float through the water. The paddle portions may be formed integrally with the body portion or may be detacha-



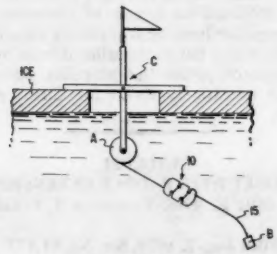
ble therefrom. Fins and flanges may be added to the paddles to increase the propelling efficiency thereof.

3,714,922
LOCK AND ALARM
Miguel da Silva, 20 W. North Ave., Cranford, N.J. 07016
Filed Mar. 9, 1971, Ser. No. 122,347
Int. Cl. G08b *15/00*
U.S. Cl. 116—14 **3 Claims**



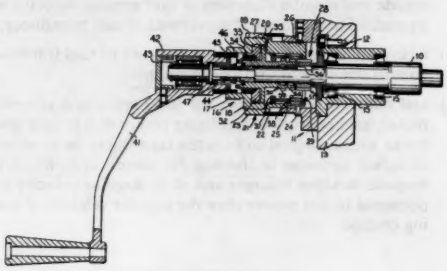
A chain type door lock having a bell and means responsive to an attempt to force the lock to sound the bell and thus create an alarm signal, said means including a rack and pinion gear, motion of the rack rotating the gear to turn a striker to strike the bell.

3,714,923
DEPTH MARKER FOR A FISH LINE
Louis J. Mariani, 605 Center Street, Jessup, Pa.
Filed April 12, 1971, Ser. No. 133,177
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **1 Claim**



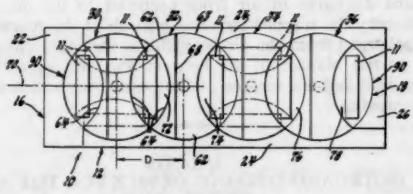
A depth marker has a plurality of wedge-shaped openings or notches extending inward from opposite side edges of the marker and the notches on one side are offset relative to those on the other side. The marker can be releasably secured to a line by winding the line back and forth alternately from side to side to engage in the notches and overlying the front and back faces of the marker.

3,714,924
DIMENSION CONVERSION INDICATOR
Stanislaw Jankowski, Birmingham, and William John Jackson, Tamworth, England, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed July 23, 1971, Ser. No. 165,557
Int. Cl. B23q *17/00*
U.S. Cl. 116—115.5 **5 Claims**



A dimension conversion indicator for a machine having relatively movable members and adapted to indicate the relative displacement of the members selectively in English or metric units has a rotatable dial bearing respective scales in these units and driven through a variable ratio gearbox from a shaft which rotates with relative movement of the members. The gearbox comprises an axially shiftable outer gear unit and two inner gear units coupled respectively with the dial and with the shaft. The outer gear unit is constantly meshed with one inner gear unit and can be meshed with a selected one of the two gear elements on the other inner unit to select the required ratio. A rotatable handle can be clutched to the inner gear unit coupled with the dial to enable the shaft to be rotated manually, the gearbox providing a transmission ratio between the handle and the shaft corresponding to the scale for time being in use.

3,714,925
VACUUM PROCESSING MACHINE
Eugene C. Helm, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed July 30, 1971, Ser. No. 167,566
Int. Cl. C23c *13/10*
U.S. Cl. 118—49 **1 Claim**



A vacuum processing machine wherein an evacuated enclosure houses a series of intermeshing two-lobe rotors which are alternately oscillated a half-revolution to thereby circumferentially shift lenticular carrier boats received within concave recesses between the lobes to a transfer

position between the rotors. The lobes of the succeeding rotors sweep the recesses to thereby shift the carrier boats to the next advanced transfer position whereby parts nested on the carrier boats are bidirectionally shifted along a common entrance and exit path in a series of arcs between handling and processing stations at opposite ends of the enclosure.

3,714,926

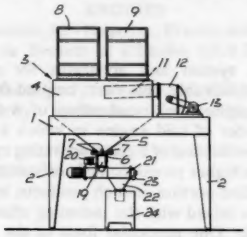
APPARATUS FOR ELECTROSTATICALLY COATING THE SURFACES OF ARTICLES WITH PULVERULENT MATERIALS

Max Ofner, Leonberg, Germany, assignor to SFB Spezial-Filterbau M. Ofner K.G., Friolzheim, Wuerttemberg, Germany

Division of Ser. No. 656,081, July 26, 1967, abandoned. This application Dec. 9, 1970, Ser. No. 96,349

Int. Cl. B05c *11/00*

U.S. Cl. 118—603 **16 Claims**



An apparatus for electrostatically coating the surfaces of articles with pulverulent materials, especially coloring substances, by spraying the material dispersed in an air current upon the article and permitting the recovery of the excessive material which is drawn off by suction from the spray chamber, treated, and then returned to the supply for immediate reuse in the spraying operation.

3,714,927

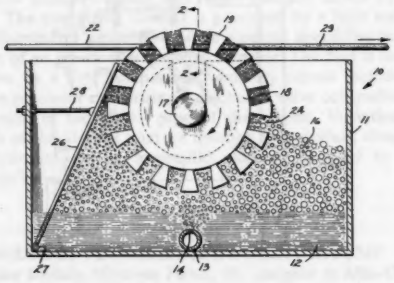
APPARATUS FOR SURFACE DYEING THE PULP INSULATION OF WIRE

Christopher John Krogel, Cranford, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 30, 1969, Ser. No. 872,675

Int. Cl. B05c *1/08, 1/16*

U.S. Cl. 118—612 **3 Claims**



A pulp-insulated wire is surface dyed by advancing the wire into frictional engagement with receptacles on a freely rotating roller. This rotates the roller to displace the receptacles through a dye solution to transfer the dye solution in the receptacles to the wire. In an alternate embodiment, air, under pressure, is introduced into the dye solution to form a layer of dye foam on the surface of the solution so that the dye foam is transferred by the receptacles to the wire.

3,714,928

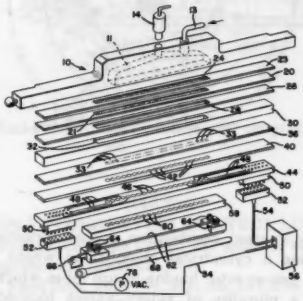
MULTIPLE JET CHANNEL

Richard P. Taylor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 17, 1970, Ser. No. 90,363

Int. Cl. B05c *5/02*

U.S. Cl. 118—624 **8 Claims**



In a noncontacting printing system in which drops of coating material are projected toward a receiving member and their trajectories controlled to provide a desired coating pattern, as in printing, the drops formed are much smaller in diameter than usual and are arranged in discrete packets of drops with each packet forming a single dot when it impinges on the receiving member.

3,714,929

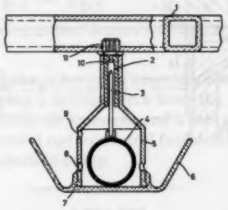
WATERING APPARATUS FOR POULTRY

Jelle Boterweg, Steninstraat 20, Kampen, Netherlands

Filed Dec. 7, 1970, Ser. No. 95,864

Int. Cl. A01k *7/02*

U.S. Cl. 119—80 **7 Claims**

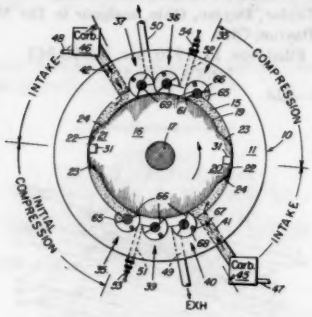


Drinking apparatus for poultry comprising a water conduit, a valve at the bottom of the conduit, and a central support for a drinking bowl detachably fastened to the valve casing below the valve.

3,714,930
ROTARY ENGINE

Malcolm J. Kelson, Sr., 10260 East Outer Drive, Detroit, Mich.

Continuation-in-part of Ser. No. 67,374, Aug. 27, 1970, abandoned. This application Oct. 5, 1971, Ser. No. 186,657
Int. Cl. F02b 53/00, 55/08
U.S. Cl. 123—8.27 7 Claims

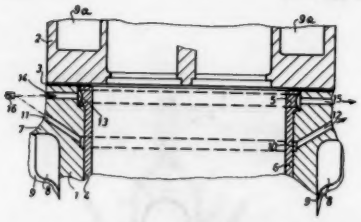


A rotary internal combustion engine includes an engine block having a cylindrical chamber in which is rotatably mounted a power rotor having piston lobes which act in concert with a plurality of rotary valves located about the periphery of the cylindrical chamber so as to provide explosion impulses which act upon the lobes to drive the rotor.

3,714,931
CYLINDER WITH DRY CYLINDER SLEEVE

Alfred Neitz, and Hans Pickel, both of Nurnberg, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft Zweigniederlassung Nurnberg, Nurnberg, Germany

Filed Nov. 5, 1970, Ser. No. 87,208
Claims priority, application Germany, Nov. 6, 1969, P 19 55 806.6
Int. Cl. F02f 1/14
U.S. Cl. 123—41.79 6 Claims

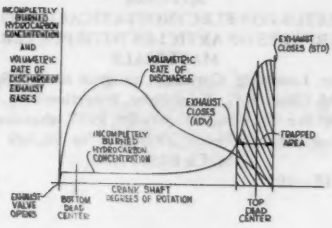


A cylinder structure with a forced cooling fluid system and with a dry cylinder bushing for a water or air-cooled piston internal combustion, in which that upper cylinder block portion which is adjacent the cylinder head has annular passage means surrounding the cylinder bore defined by the cylinder block or by a bushing therein while feeding and discharge passage means establish communication between said annular passage means and said cooling fluid system.

3,714,932
EMISSIONS CONTROL SYSTEM

George B. K. Meacham, Birmingham, Mich., and William S. Nagel, Cincinnati, Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Continuation of Ser. No. 746,644, July 22, 1968, abandoned. This application Aug. 19, 1971, Ser. No. 173,068
Int. Cl. F01l 1/34; F02d 39/02
U.S. Cl. 123—75 E 14 Claims

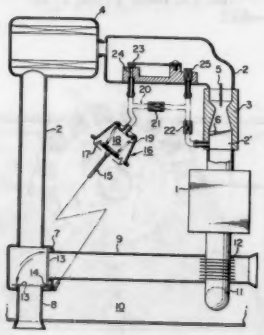

INCOMPLETELY BURNED HYDROCARBON CONCENTRATION AND VOLUMETRIC RATE OF DISCHARGE OF EXHAUST GASES
VOLUMETRIC RATE OF DISCHARGE
EXHAUST CLOSES (STD)
EXHAUST CLOSES (ADV)
TRAPPED AREA
INCOMPLETELY BURNED HYDROCARBON CONCENTRATION
EXHAUST VALVE OPENS
BOTTOM DEAD CENTER
CRANK SHAFT DEGREES OF ROTATION
TOP DEAD CENTER

A method, system and apparatus for minimizing the amounts of undesirable pollutants emitted from an internal combustion engine after combustion of a fuel-air mixture within a cylinder of said engine in which a portion of the products of combustion of a given operating cycle, which portion contains a higher proportion of noxious constituents than does the expelled portion of such products, is retained in the cylinder and is mixed with the incoming charge for the next operating cycle. One particular form of the invention comprises varying the proportion of such retained products according to engine operating conditions in order to maintain the dilution of such incoming charge at the maximum level consistent with good engine performance. The retained products are in an amount in excess of that normally retained in the cylinder clearance volume at the exhaust manifold pressure.

3,714,933
AUTOMATIC TEMPERATURE CONTROL DEVICE FOR INTAKE AIR OF AN INTERNAL COMBUSTION ENGINE

Masaaki Ozaki, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 11, 1971, Ser. No. 197,687
Claims priority, application Japan, Nov. 16, 1970, 45/100141
Int. Cl. F02m 23/14, 15/00, 31/08
U.S. Cl. 123—122 D 2 Claims



An automatic temperature control device for intake air of an internal combustion engine comprises a control valve for adjusting the ratio of the amount of cool air and hot air each supplied into the interior of the intake pipe of the engine so as

to control the temperature of intake air, and a negative pressure motor for operation of said control valve which negative pressure chamber is, on one hand, in conjunction with the interior of the intake pipe downstream of a throttle valve, and is, on the other hand, opened into the atmosphere through a temperature sensitive valve being operatable according to variation of the temperature of the engine or an adjacent point thereof. The air passage between the negative pressure chamber of the negative pressure motor and the interior of the intake pipe has an one-way valve and two invariable orifices on its way. The one-way valve permit air to pass through the air passage just from the negative pressure chamber of the negative pressure motor to the interior of the intake pipe, and one of the invariable orifices is interposed between the one way valve and the intake pipe, while the other makes the air passage between said one-way valve and said other invariable orifice open into the atmosphere.

3,714,934

FUEL FEED DEVICES FOR INTERNAL COMBUSTION ENGINES

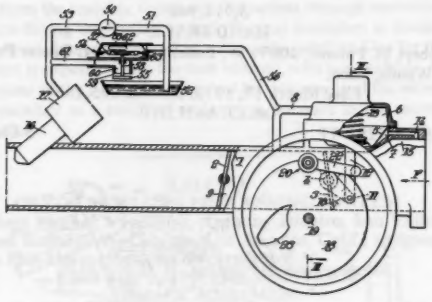
Francois Mennesson, 92 - Nanterre, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Sept. 7, 1971, Ser. No. 178,217

Claims priority, application France, Sept. 15, 1970, 7033451

Int. Cl. F02m *51/02, 39/00*

U.S. Cl. 123—139 AW **2 Claims**



Valves supplied from a source of fuel under pressure are each actuated by an electromagnet energized over a variable fraction of each revolution of a rotary member driven by the engine. The energizing current is governed by a light source which illuminates a photo-sensitive element according to the position of an intermediate rotary member. The fuel is fed to the valve by a fuel pump whose delivery circuit includes a pressure regulator comprising a discharge valve controlled by the suction in the intake pipe of the engine. Variation of richness of the air/fuel mixture through temperature changes is compensated by a bimetallic element coupled to the discharge valve.

3,714,935

MULTIPLE PLUNGER FUEL INJECTION PUMP

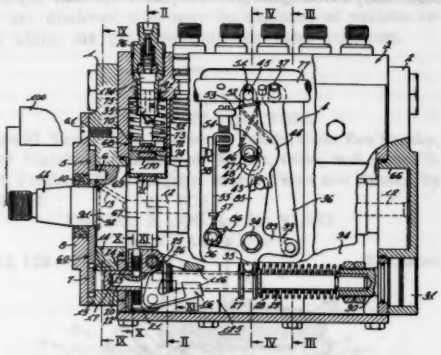
Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 15, 1971, Ser. No. 180,689

Int. Cl. F02m *59/00*

U.S. Cl. 123—140 R **10 Claims**

A multiple plunger fuel injection pump having compact arrangement of the fuel supply pump, a high speed governor, an



automatic fuel timing, fuel quantity, and programing of fuel delivery.

3,714,936

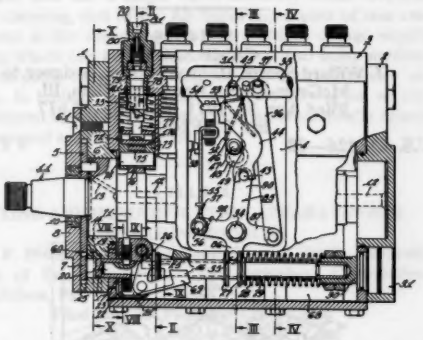
MULTIPLE PLUNGER FUEL CONTROL LINKAGE

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 16, 1971, Ser. No. 181,094

Int. Cl. F02m *59/00*

U.S. Cl. 123—140 R **10 Claims**



A fuel control linkage having a centrally pivoted lever with a drive arm receiving a driving force from the governor and a timing arm, a quantity control arm, and a fuel programing arm connected to a control rod to control fuel delivery for a multiple plunger fuel injection pump.

3,714,937

BARBECUE GRILL ASSEMBLY

Robert S. Linstead, Rockford, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

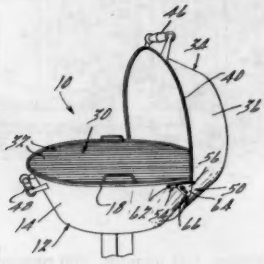
Filed Jan. 11, 1971, Ser. No. 105,367

Int. Cl. A47J *37/00;* **F24b** *3/00*

U.S. Cl. 126—25 R **4 Claims**

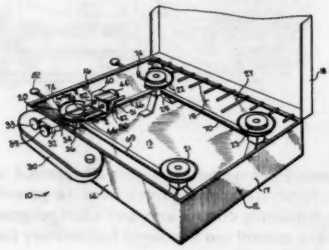
A barbecue grill assembly comprising a lower enclosure member provided with a generally horizontally disposed food

supporting grill, an upper enclosure member adapted to be mounted on the first member, and means for movably connecting the upper and lower enclosure members whereby the upper enclosure member is movable between a first position substantially covering the grill and a second position providing



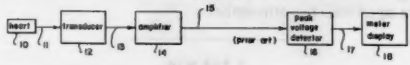
access to the grill, the last mentioned means including means for pivotably supporting the upper enclosure member and for translating the upper enclosure member relative to the lower enclosure member as the former member is moved between the first and second positions.

3,714,938
CAMP STOVE
J. Willard Spotts, Huntsville, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Apr. 20, 1971, Ser. No. 135,617
Int. Cl. F24c *5/20*
U.S. Cl. 126—38 **9 Claims**



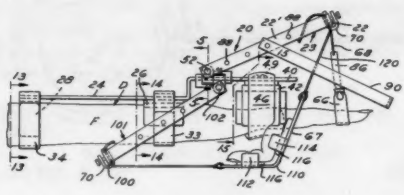
A camp stove having separate burners that receive fuel from separate vaporizing tubes, but where one burner heats both of the vaporizing tubes; and further having a control as between two burners that receive fuel mixture from the same vaporizing tube such that when the control is closed it directs all of the mixture to the first burner but as it is shifted to admit fuel mixture to the second burner it also throttles the fuel mixture passage to the first burner so that fuel mixture is directed to the burners in approximately equal quantities when the control is fully shifted.

3,714,939
ANALOG SIGNAL SELECTIVE-PEAK SAMPLER SYSTEM FOR BLOOD PRESSURE SIGNALS
Christopher C. Day, Newtonville, and Wesley R. Grace, Andover, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed June 1, 1970, Ser. No. 42,213
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 A **14 Claims**



A system for sampling selected peak values of an analog signal. A system is disclosed for detecting peak occurrences of a signal and for triggering a device which operates on the signal. One such device described herein is a numerical display device. The system includes means for limiting the repetition rate of peak-indicating trigger pulses to a rate between upper and lower predetermined rate-limits. The system can be used in various applications and is particularly useful in the numerical display of systolic pressure as disclosed herein. The repetition rate limits employed herein are compatible with the ability of the human eye and brain to sense and absorb visual numerical information.

3,714,940
HAND BRACE
Robert M. Palmer, 20099 W. Ballantyne Court, Grosse Pointe Woods, Mich.
Filed March 17, 1971, Ser. No. 125,165
Int. Cl. A61f *5/10*
U.S. Cl. 128—77 **5 Claims**

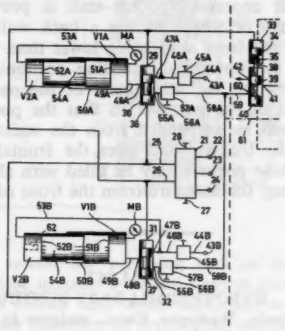


A hand brace providing controlled individual flexion, extension, adduction and abduction tension of the digits particularly though not exclusively suited for post-operative use during formation of the fibrous joint capsule following metacarpophalangeal and proximal interphalangeal joint implant arthroplasty and the like, includes a longitudinal member adapted to overlie the forearm and be releasably secured thereto and having a stabilizing pad for juxtaposition on the flat dorsal area of the ulna and radius just above the carpus with the proximal end terminating just short of the elbow and the distal end overhanging the hand and having means for engaging and positioning the metacarpophalangeal area and further adjustably supporting a transverse member in spaced relation above and/or below the hand which adjustably carries digit slings for effecting the flexion and/or extension movement of the digits. The slings are connected to the frame means by connectors permitting quick and simple adjustment by the surgeon and one hand adjustment by the patient. In addition to or in lieu of the slings, pressure pads may be mounted to engage the phalanges to position them as required. The brace may be folded flat for shipping or storage.

3,714,941
MEDICAL RESPIRATORS

Barry John Kipling, Cambridge, England, assignor to Pye Limited

Filed April 24, 1970, Ser. No. 31,515
Claims priority, application Great Britain, June 5, 1970, 243/70
Int. Cl. A61m *15/00*
U.S. Cl. 128—145.8 **11 Claims**

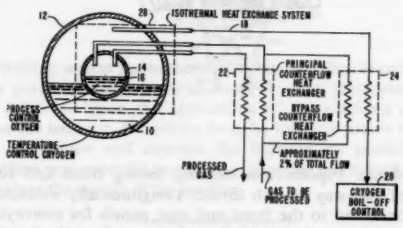


A medical respirator in which gas is stored and passed to a patient in an adjustable predetermined time having switch means to control the flow of gas from a pressure source into a variable volume during the expiration period of the respirator and from the variable volume to the patient through restrictive means during inspiration period. The gas container is divided into two volumes separated by a movable member. Gas for the patient is expelled from the first volume, which is variable, by decrease of the first volume caused by movement of the movable member as a result of patient gas pressure in the second volume.

3,714,942
CRYOGENIC GAS PROCESSING SYSTEM

Halbert Fischel, Van Nuys, Anthony Dichiro, Sun Valley, and Kenneth W. Cowans, Los Angeles, Calif., assignors to Sub-Marine Systems, Incorporated

Filed Feb. 3, 1969, Ser. No. 795,838
Int. Cl. A26b *7/02*
U.S. Cl. 128—142 **9 Claims**

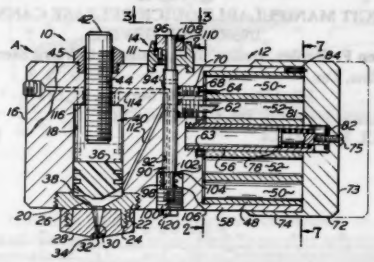


Efficient use of the refrigeration capacity of a cryogenic supply, while also maintaining temperature control of a process control cryogen during passage of a gas mixture in communication with the process control cryogen, is achieved by employment of a bypass heat exchange between the cryogen supply and a portion of the gas mixture, which is also passed through a principal counterflow heat exchanger. Isothermal heat exchangers using the cryogenic supply and the processed gas mixtures may also be disposed along the gas flow path to restrict unwanted heat dissipation and to assure temperature uniformity, so as to obtain efficient and full range cooling of the gas mixture. Compact and efficient heat exchange units are disclosed that may be disposed at various regions along the gas flow path for these purposes.

3,714,943
MEDICAMENT INJECTORS

Howard M. Yanof, 5224 Keersdale, Toledo, Ohio; Ben Pansky, 2809 Manchester Boulevard, Toledo, Ohio, and James S. Poff, Findlay, Ohio, assignors to said Yanof and Pansky, by said Poff

Filed Dec. 1, 1970, Ser. No. 93,982
Int. Cl. A61m *5/30*
U.S. Cl. 128—173 H **22 Claims**

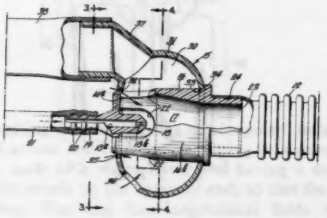


The specification and drawings disclose two embodiments of medicament injectors of the type commonly referred to as "velocity injectors." Both embodiments provide means by which the quantity of medicament can be varied. Each embodiment also has a single valve assembly which controls filling, cleaning, and firing. An important aspect of one embodiment is the use of a rotatable multiple dosage supply housing which can be sequentially indexed to bring medicament ampules into proper relationship with the valve assembly. In addition to the features noted above, the second embodiment discloses an injector which automatically injects when pressed against the patient.

3,714,944
MIXING AND HUMIDIFICATION APPARATUS FOR BREATHING DEVICES

James F. Price, Center Valley, and Kenneth Shook, Nazareth, both of Pa., assignors to The Bethlehem Corporation, Bethlehem, Pa.

Filed Nov. 25, 1970, Ser. No. 92,658
Int. Cl. A61m *15/00*
U.S. Cl. 128—209 **3 Claims**



A breathing device having an elongated flexible inlet conduit is provided with removable apparatus for enriching am-

bient air with predetermined percentages of oxygen and for humidifying the mixture before the mixture is admitted to the device. The apparatus comprises a hollow cylindrical body with a mixing chamber and an oxygen injector extending coaxially into the chamber. An exhaust port is provided in one end of the body to open into the device-conduit, and a series of intake ports surround the injector at the other end of the body to coact with the injector for causing ambient air to mix with oxygen for inhalation by the patient. A removable hollow shell surrounds the body and registers with the intake ports, and the shell has means providing a connection to a source of water vapor for humidifying the oxygen-air mixture in the mixing chamber. In addition, a method is disclosed for weaning a patient away from oxygen dependency, the method comprising the steps of periodically replacing the mixing-body with like bodies having progressively lower percentages of oxygen in the mixture after predetermined time intervals.

3,714,945
DIGIT MANIPULABLE QUICK RELEASE CANNULA INSERTION DEVICE

Vayden F. Stanley, Dallas, Tex., assignor to Vicra Sterile, Inc., Dallas, Tex.

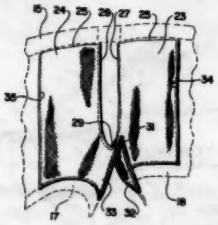
Filed Dec. 17, 1970, Ser. No. 99,111
Int. Cl. A61m *05/00*
U.S. Cl. 128—214.4 **8 Claims**

An over-the-needle catheter insertion device wherein the catheter and needle are connected to respective interconnecting hub members. The catheter hub member is connectable to an infusion source. The catheter hub member has an outwardly extending ridge molded integrally therewith, providing a means by which the catheter hub and needle hub can be separated by manipulation of only one hand.

3,714,946
GARMENT WITH ABSORBENT FRONT AND CROTCH PAD POCKETS

Harry L. Rudes, 996 E. 22nd St., Brooklyn, N.Y. 11210

Filed Apr. 5, 1971, Ser. No. 130,945
Int. Cl. A61f *13/16*
U.S. Cl. 128—295 **6 Claims**

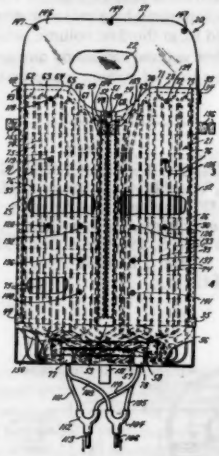


A twin pocket wall piece is secured to the front and to the underside and crotch of the garment into which absorbent material can be extended to provide an area over the front and under the crotch of the wearer for the absorption of body perspiration in this area of the body to prevent the outer material of the garment from becoming wet. The twin pocket pieces are separated over the fly area, being cut away to accommodate the hems of a garment that opens in the front and have open upper edges through which the material is extended and extensions are provided at the lower ends to accommodate the crotch area and the inner sides of the legs at the front of the garment. According to further form of the invention a self contained pocket unit is provided of two pockets each of which having a back wall and a front wall, with the front wall being lower than the back wall and with the upwardly extending portions of the back wall serving for the attachment of the pad unit to the waist band of the garment so that the pocket elements or units will be suspended from the waist band at the front of the trousers and over the frontal area of the wearer. These pockets may be filled with absorption material to keep the moisture from the front of the trousers.

3,714,947
HYPOTHERMIA BABY BUNTING

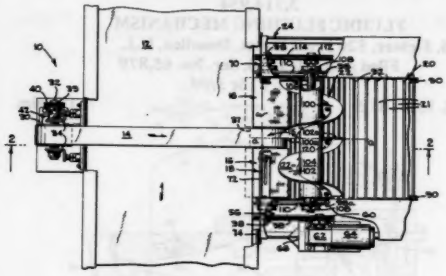
John C. Hardy, Weatogue, Conn., assignor to Angelica Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 114,607, Feb. 11, 1971. This application Feb. 11, 1971, Ser. No. 114,466
Int. Cl. A61f *7/00*
U.S. Cl. 128—400 **9 Claims**



An infant's hypothermia bunting having front and rear panels of two-way stretch fabric. Longitudinally extending tubes connected to the front and rear panels for conveying temperature-controlled fluid. Snap fasteners for adjusting the lateral size of the bunting and snap fasteners for adjusting the longitudinal size of the bunting to conform to different infant body sizes. Zippers at the center and sides of the bunting to provide body access for hospital purposes. A plastic liner releasably fastened to the rear panel for distributing the loads of tube projections. A pocket at the bottom of the bunting for containing manifolds collecting inlet ends of the tubes and outlet ends of the tubes for common connections to the inlet and outlet fittings of a hypothermia machine.

3,714,948
BRUSH BACK ROLLER
Bobby Joe Sears, and Wade E. Brown, both of Hoopeston, Ill., assignors to FMC Corporation, San Jose, Calif.
Filed Aug. 10, 1971, Ser. No. 170,536
Int. Cl. A01f *12/10*
U.S. Cl. 130—5 R **4 Claims**



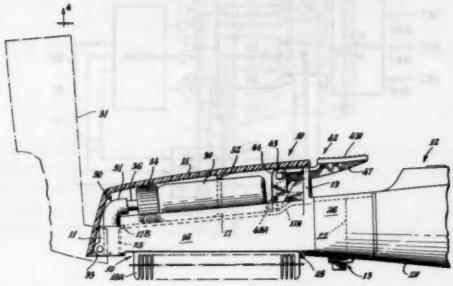
A conveyor system for supplying ears or corn to a processing machine includes a cleated elevator conveyor for the corn, and a double helix brush back rotor is disposed above the elevator conveyor for leveling the ears of corn on the conveyor as well as for laying down upwardly projecting ears from the sides of the conveyor towards the midplane thereof.

3,714,949
CIGARETTE FILTER
David M. King, Route 7, P.O. Box 219, Dalton, Ga.
Filed Feb. 16, 1971, Ser. No. 115,317
Int. Cl. A24d *1/04*; **A24f** *7/04, 13/06*
U.S. Cl. 131—10.5 **10 Claims**

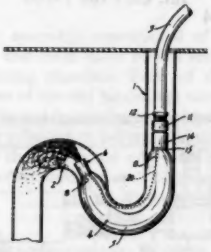
Filtering means for tobacco wherein the filter is composed of a permselective membrane supported in juxtaposition to the tobacco. Upon the application of the smoking process upon the tobacco, the smoke from he tobacco passes through the membrane and deposits the harmful tar particles and nicotine vapors on the membrane, allowing less harmful gas to pass into the mouth of the smoker.

3,714,950
SPRAY APPARATUS
Aivars Miska, Bridgeport, and Howard L. Selman, Niantic, Conn., assignors to Sperry Rand Corporation, New York, N.Y.
Filed May 12, 1971, Ser. No. 142,513
Int. Cl. A45d *24/22*
U.S. Cl. 132—112 **6 Claims**

Spray apparatus for apparatus of the type which includes a source of supply of hot air and a hair grooming implement holder connectable to the source, wherein the holder is adapted to carry a hair grooming implement and guide hot air from the source laterally of the implement for heating the user's hair. The spray apparatus includes an elongated base upon which a liquid carrying container provided with a dispensing tube may be mounted, a nozzle assembly connected to one end of the base includes a conduit and liquid atomizing apparatus, and container moving apparatus connected to the other end of the base. The atomizing apparatus terminates one end of the conduit with an exit orifice for directing liquid, as a spray, towards the user's hair. The container moving apparatus is operable to move the container towards the other end of the conduit for dispensing liquid from the container through the dispensing tube and into the conduit for flow via the atomizing apparatus to the exit orifice.



3,714,951
CONDUIT FLUSHER
Philip L. Lundman, 1709 East Menlo Blvd., Milwaukee, Wis.
Filed Aug. 27, 1970, Ser. No. 67,395
Int. Cl. B08b *9/02*
U.S. Cl. 134—167 C **2 Claims**



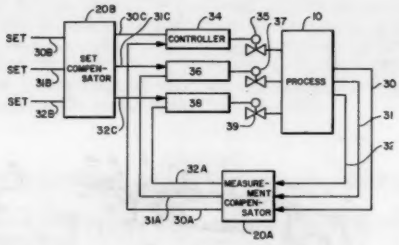
A conduit flushing device including an elongated, inflatable bag connected at one end by a tubular fitting to a source of fluid pressure, such as a water hose, and having a smaller diameter tubular nozzle on the opposite end, so that the fluid inflates the bag. The bag has longitudinal folds which facilitates collapse of the bag when the fluid pressure is shut off, and an elongated, deformable strip extends within the bag from the fitting to the nozzle and aids in maintaining the desired shape of the bag.

3,714,952

METHOD AND APPARATUS FOR COMPENSATORY CONTROL OF INTERACTING PROCESS VARIABLES

Edgar H. Bristol, II, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Mar. 24, 1971, Ser. No. 127,722
Int. Cl. G05b 13/00
U.S. Cl. 137—1 8 Claims



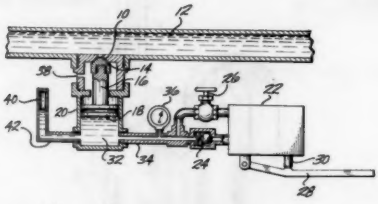
When process valves reach their limits, a special control problem arises because the valve limit then effectively introduces a discontinuity in control behavior. An approach is taken for improved control of a process having interacting variables wherein valve controllers are connected directly to valves which in turn are in control of the process controlled variables. Compensation means for the process interacting variables processes the process measurements and set points either separately, in one version, or in an integrated fashion, in another version, providing compensated error signals to the respective process controllers. In this manner, saturation of a valve affects only its process controlled variable, and the limit discontinuity is restricted in its adverse effect, thereby providing improved control under conditions of process saturations.

3,714,953

PRESSURE RELIEF VALVE

Paul O. Solvang, Tacoma, Wash., assignor to National Water-Blast Inc., Tacoma, Wash.

Filed Oct. 20, 1971, Ser. No. 190,928
Int. Cl. F16k 15/02
U.S. Cl. 137—14 12 Claims



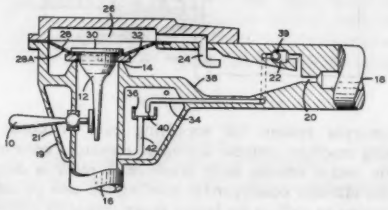
An apparatus and method of relieving excess fluid pressure using a hydraulic cylinder to urge a hydraulic plug against a valve seat in communication with the fluid to be controlled. The hydraulic fluid used in the hydraulic cylinder is selected to have a compressibility at least as great as the compressibility of a paraffinic base mineral oil having a viscosity of about 20 to 50 centipoises at 25° C. to act as a liquid spring in response to excess fluid pressure. Also disclosed is the use of an air chamber in communication with the hydraulic fluid in the hydraulic cylinder which in combination with ordinary hydraulic fluid acts as a fluid spring.

3,714,954

FLUIDIC FLUSHING MECHANISM

Barry S. Fichter, 526 Front Street, Dunellen, N.J.

Filed Aug. 21, 1970, Ser. No. 65,879
Int. Cl. F15c 3/04
U.S. Cl. 137—81.5 1 Claim



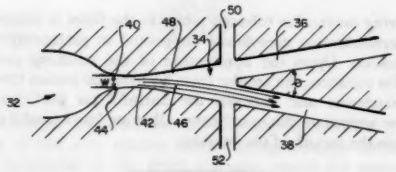
A valve mechanism of the type used to flush toilets is provided with a timing device which automatically stops the water flow after a predetermined quantity of water has passed through the valve mechanism. The timing is achieved by filling a receptor with water to a predetermined height. The filling rate for the receptor is directly related to the rate of flow through the system but is not adversely dependent upon the water pressure in the system. At the predetermined time, the fluidic switch responds and causes the valve to close.

3,714,955

SIDE WALL SEPARATOR FLUIDIC LOGIC DEVICE

Roland Pierce Trask, II, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed July 7, 1971, Ser. No. 160,286
Int. Cl. F15c 1/08; F15d 1/06
U.S. Cl. 137—839 5 Claims



A low power side wall separation fluidic logic device is disclosed having laminar flow characteristics. The device defines an element having a smooth, continuous, and gradual transition from a power jet throat to receiver output lines with a minimized angle being maintained between the receiver lines so as to achieve low power operation.

3,714,956

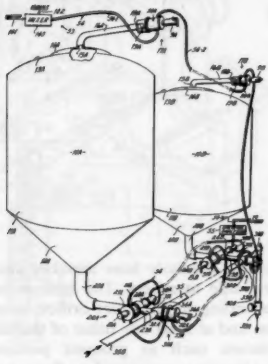
ASEPTIC STORAGE AND VALVING SYSTEM

Philip E. Nelson, West Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Continuation-in-part of Ser. No. 40,550, May 26, 1970, Pat. No. 3,678,956. This application May 18, 1972, Ser. No. 254,733

Int. Cl. F16k *51/00*

U.S. Cl. 137—238 9 Claims



A plurality of storage tanks for bulk storage of materials under aseptic conditions in which valves associated with the tanks have chambers filled with liquid chemical sterilant surrounding movable valve actuators for preventing the influx, via the valve actuators, of contaminants to the material stored in the tanks. The chemical sterilant is unheated to prevent the transfer of heat from the sterilant to the stored material. The sterilant chambers are connected serially to form a cascade between a source of fresh sterilant and a chemical analyzer, with the chambers which become more contaminated in use being connected in the cascade more remote from the fresh sterilant supply. The sterilant chambers are recharged with fresh sterilant by a flow of fresh sterilant from the supply through the cascade, which flow is terminated when the sterilant leaving the last chamber of the cascade upon analysis by the chemical analyzer has reached a sterile level indicating that the fresh sterilant has propagated through the cascaded chambers successively flushing the chambers in the cascade of inactive, or stale, sterilant and replenishing the chambers with fresh sterilant. Each sterilant chamber is provided with an inlet passage and an outlet passage located at the bottom and top of the chambers, respectively, such that fresh sterilant enters the bottom of the chamber, forcing inactive, or stale, sterilant from the chamber through the top, insuring complete recharging of the entire chamber with fresh sterilant.

3,714,957

SELF-CLEANING STORM CHOKE

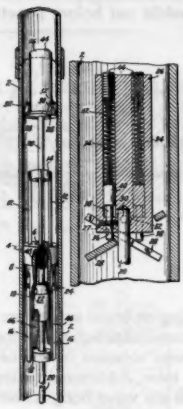
William N. Schoeffler, Rte. 1, P.O. Box 389, Carencro, La.

Filed July 21, 1971, Ser. No. 164,654

Int. Cl. F16k *17/28, 29/00*

U.S. Cl. 137—244 10 Claims

A conduit has a valve with a valve seat fixed in the conduit and a valve member movable longitudinally to open or close the valve. Vanes fixed relative to the valve member cause the assembly to rotate during fluid flow in the conduit to cause cleaning means to constantly wipe the valve seat and valve member clean of any foreign matter in the fluid. The vanes respond to pressure or velocity surges to assume positions substantially closing the conduit and to then act like a piston to pull the valve closed.



3,714,958

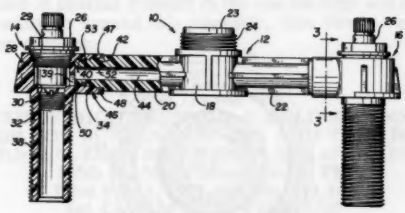
MIXING VALVE ASSEMBLY

Tom W. Johnson, and Joe L. Johnson, both of Burton, Ohio, assignors to Sajar Plastics, Inc., Middlefield, Ohio

Continuation-in-part of Ser. No. 101,810, Dec. 28, 1970, abandoned. This application March 1, 1972, Ser. No. 230,592

Int. Cl. F16k *19/00*

U.S. Cl. 137—315 6 Claims



A mixing valve assembly constructed of plastic parts in which end pieces that form valve bodies receive the ends of conduits of a mixing chamber. Ends of the conduits are received in recesses of the end pieces, are secured by an adhesive or solvent, oriented by mating non-circular portions, and sealed by both the adhesive or solvent and an O-ring between each conduit and the connected end piece. In addition, the parts can be further secured and sealed by an ultrasonic weld.

3,714,959

PERMANENT PIERCING ACCESS VALVE

Tony Pignataro, Jr., Montpelier, Ohio, assignor to Robinair Manufacturing Corporation, Montpelier, Ohio

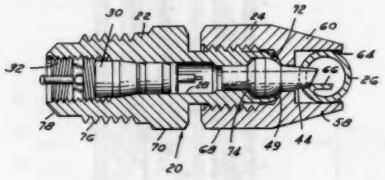
Filed March 5, 1971, Ser. No. 121,357

Int. Cl. B23b *41/08*; F16e *41/04*

U.S. Cl. 137—318 7 Claims

A permanent access valve for use in sealed fluid systems to pierce a fluid line thereof without leaking fluid from the system or allowing contaminants to enter the system. The device includes a straddle nut having a tube embracing portion adapted to be soldered or brazed to the fluid line, and a valve body threadably engageable within the straddle nut. A piercing needle is rotatably supported within the body, and

has a line-piercing portion which projects through an aperture in the nut and pierces the fluid line as the valve body is screwed into the nut. The piercing portion of the needle is rearwardly tapered to engage the marginal edge of the aperture in the straddle nut before penetration of the fluid line,



thereby providing an initial seal to prevent the escape of fluid or entry of contaminants before the tube is pierced, and additionally to prevent rotation of the needle during the actual piercing of the tube. Additional sealing around the needle is accomplished as the valve body is completely engaged within the straddle nut.

3,714,960

SPECIAL THERMAL ELECTRIC POWER GENERATING UNIT USING PRESSURIZED HOT AIR TOGETHER WITH SUPERHEATED STEAM

Kiichi Yamada, No. 15-12, 1-chome, Jengumae, Shibuya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 772,239, Oct. 31, 1968, Pat. No. 3,597,621. This application Dec. 30, 1970, Ser. No. 102,873

Claims priority, application Japan, Dec. 1, 1967, 42/76761

Int. Cl. F16k *49/00*

U.S. Cl. 137—340 **5 Claims**

A thermal electric power generating unit using pressurized hot air together with superheated steam, which is useful for storing superfluous electric energy of thermal power plants in the form of compressed air during an off-peak load period, and for regenerating electric power by using the thus stored compressed air during succeeding peak load periods. The unit comprises a means for producing compressed air, a boiler to produce superheated steam, a drum within the boiler for heating the compressed air, a special injection nozzle to simultaneously inject said superheated steam and the pressurized heated air, a gas turbine to be driven by gaseous mixture jets from said nozzle, and an electric generator driven by said gas turbine. The injection nozzle comprises a hollow toroidal member having adjacent but separated input and output orifices, and having a heating coil disposed therein for maintaining the gas at a desired temperature as it is being discharged.

3,714,961

MANHOLE ASSEMBLIES

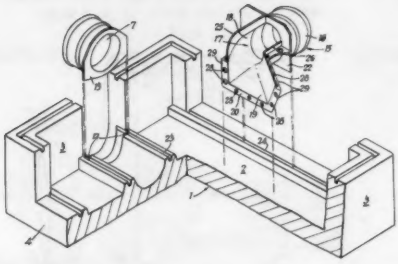
Alastair Ritchie Davidson, and Eric Robert Percival, both of London, England, assignors to Reed International Limited, London, England

Filed Oct. 15, 1971, Ser. No. 189,668

Claims priority, application Great Britain, Oct. 28, 1970, 51,237/70

Int. Cl. E02d *29/00*

U.S. Cl. 137—363 **7 Claims**



A preformed manhole base member comprises a bottom and integral side members. The bottom has a main outlet channel extending to an outlet orifice in one side member. The bottom and at least one other of the side members have locating means such as grooved portions for receiving cooperating locating means such as flanges on inflow channel bends so that correct location of an inflow bend with respect to the main outlet channel is obtained.

3,714,962

PIPELINE SYSTEMS

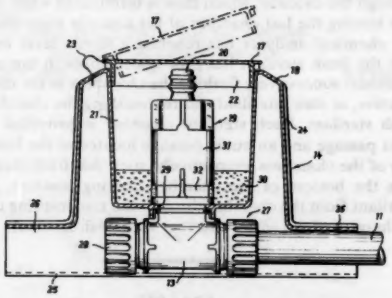
Roland Sauer, Einsingen, Johannes Katzer, Neu-Ulm, and Christian Stephany, Erbach, Germany, assignors to Kupex AG

Filed July 15, 1971, Ser. No. 162,807

Claims priority, application Germany, July 21, 1970, P 20 36 215.6

Int. Cl. B05b *1/14*

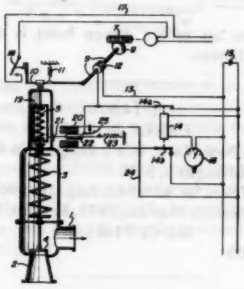
U.S. Cl. 137—371 **27 Claims**



The invention provides a pipeline system, advantageously an underground pipeline system, having a number of coupling elements at various localities all connected to a mains liquid supply and each adapted to receive a quick fastening plug-in connector. Each coupling element includes a shut-off valve which is automatically opened when the plug-in connector is fitted. The pipeline system includes a plurality of lengths of plastics piping, a peripheral groove being provided in each end of each pipe length. A resilient ring is fitted in each groove and is received within an end portion of a hollow connecting body

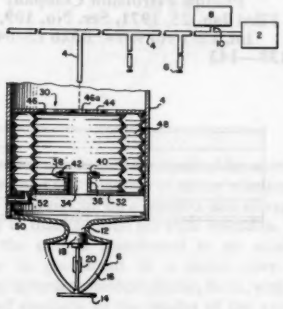
and clamped by means of a clamping nut screwed onto the connecting body end portion. The connecting body forms part of connecting means for connecting the pipe lengths to one another and to the coupling elements.

3,714,963
SPRING LOADED SAFETY VALVE
Carl Heinz Hafele, 83 Bergstrasse, 4050 Monchengladbach, Germany
Filed Sept. 13, 1971, Ser. No. 179,980
Claims priority, application Germany, Sept. 14, 1970, P 20 45 282.8
Int. Cl. F16k *31/00*
U.S. Cl. 137—487.5 14 Claims



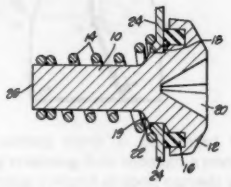
A safety valve in which a valve member is biased toward valve closing position and in which an auxiliary spring is provided for acting on the valve in closing direction. In response to a certain maximum pressure at the valve inlet, the auxiliary spring is suddenly released from the valve member to permit quick opening thereof. The spring is then automatically preloaded without imposing any load on the valve member and thereafter, upon the pressure at the valve inlet reducing to a predetermined minimum pressure, the load of the spring is again imposed on the valve member.

3,714,964
DOUBLE RATE FLOW CONTROLLER
William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.
Original application Oct. 24, 1968, Ser. No. 770,248, now Patent No. 3,592,270. Divided and this application Aug. 6, 1970, Ser. No. 61,801
Int. Cl. F16k *13/04*
U.S. Cl. 137—513.3 4 Claims



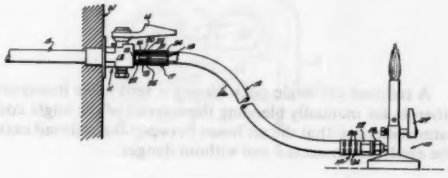
A double rate flow controller including a means for permitting fluid flow at a first high flow rate, a means for reducing the first flow rate to a second lower flow rate and a means for regulating the volume of water passing through the flow controller during the high flow condition before the high flow rate is terminated and the low flow rate begins.

3,714,965
PRESSURE RELIEF VALVE
Clarence H. Bentley, Los Angeles, Calif., assignor to Delbert John Bentley, Albert Byron Bentley, Douglas Rodney Bentley, and David Alan Bentley, fractional part interest to each
Filed Mar. 24, 1971, Ser. No. 127,734
Int. Cl. F16k *17/04*
U.S. Cl. 137—541 5 Claims



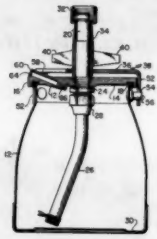
A pressure relief valve for aerosol cans comprising a stem portion and a head portion, a stepped spring on said stem portion, a washer between said head portion and the stepped spring. The stepped spring being utilized to threadably engage a hole in said aerosol can until the stem is completely inside of said can placing said washer adjacent the outside of said can between said can wall and the head, then the stepped spring acting to cause a complete closure between the can wall and the washer. On increase in internal pressure in the can the stem will move outwardly to expand this assembly, thus slowly venting excess pressure.

3,714,966
FLEXIBLE HIGH PRESSURE GAS LINE CONNECTOR FOR BUNSEN BURNERS AND THE LIKE
Melvyn N. Zobler and Joy Zobler, both of 1829 NE. 185th St., North Miami Beach, Fla.
Filed Feb. 1, 1971, Ser. No. 111,243
Int. Cl. F23d *13/40;* F16b *15/00*
U.S. Cl. 137—560 3 Claims



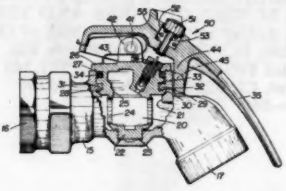
A flexible gas line or conduit for connection between a fixed gas supply line and a movable gas burning appliance such as a Bunsen burner or hand torch, and which is capable of withstanding high internal pressures without leakage, is described. Both the gas service cut-off valve outlet nipple of the fixed installation and the gas feed nipple of the appliance are externally threaded to receive, removably screw-fitted thereon, connector fittings provided at each end of a high pressure flexible hose.

3,714,967
SIPHON PAINT SPRAY CUP ASSEMBLY
Frank M. Zupan, Arlington Heights, Ill., and Jerome N. Zurek, Chicago, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.
Filed May 14, 1971, Ser. No. 143,313
Int. Cl. F16k *45/04*
U.S. Cl. 137—588 **6 Claims**



The following specification describes a spray gun paint cup assembly having an angularly disposed elongate vent passageway and reservoir in the cup cover to limit paint drip and a three-spoked screw sleeve on the cup conduit to enable the application of large torque for fastening the cover to the cup.

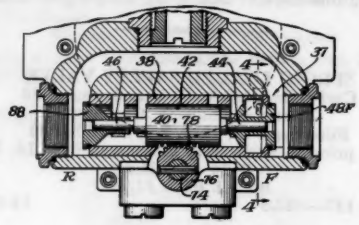
3,714,968
ANGLE COCKS WITH VENT VALVES
Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.
Filed Sept. 29, 1971, Ser. No. 184,838
Int. Cl. F16k *11/00*
U.S. Cl. 137—596.2 **13 Claims**



A railroad car angle cock having a vent valve incorporated therein for manually bleeding the interior of the angle cock to atmosphere so that the air hoses between the railroad cars can be easily disconnected and without danger.

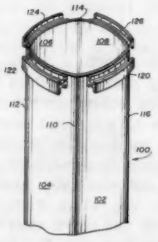
3,714,969
SEQUENTIAL VALVE FOR ROTARY VANE AIR MOTORS
John R. Hanning, Bryan, Ohio, assignor to The Aro Corporation, Bryan, Ohio
Continuation-in-part of Ser. No. 781,061, Dec. 4, 1968, abandoned. This application Dec. 30, 1970, Ser. No. 102,802
Int. Cl. F04b *49/02*
U.S. Cl. 137—630.15 **14 Claims**

An improved valve assembly has one inlet and two outlets. The valve is operable to sequentially provide a fluid flow path first between the inlet and one outlet and next between the inlet and both outlets. Utilization of the valve assembly for a



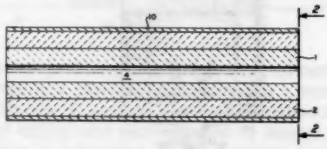
rotary vane type air motor driven hoist is described as a preferred embodiment.

3,714,970
LARGE DUCTS
Laszlo Kunsagi, New York, N.Y., assignor to Foster Wheeler Corporation, Livingston, N.Y.
Continuation of Ser. No. 850,541, Aug. 14, 1969, abandoned. This application May 26, 1971, Ser. No. 147,259
Int. Cl. F16l *9/04*
U.S. Cl. 138—109 **1 Claim**



Large fluid ducts made up of plates require little or no reinforcement, are relatively free of vibration and create comparatively little resistance to fluid flow. The plates are bowed to reinforce them against vibration and thereby obviate or reduce the use of reinforcing members.

3,714,971
HIGH TEMPERATURE REFRACTORY LINING
Charles R. Venable, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Jan. 25, 1971, Ser. No. 109,683
Int. Cl. F16l *9/14;* **B32b** *15/04*
U.S. Cl. 138—143 **5 Claims**



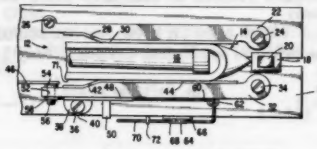
A refractory lining composition comprising an inner chrome alumina prefired shape and an outer layer comprising lightweight alumina castable.

3,714,972

SHUTTLE BOXING DETECTOR FOR FLY-SHUTTLE LOOMS

Jack C. Amato, Mine Hill, N.J., and Eugene A. Sansone, Belle Meade, N.J., assignors to The Singer Company, New York, N.Y.

Filed June 18, 1971, Ser. No. 154,528
Int. Cl. D03d 51/00
U.S. Cl. 139—336 4 Claims



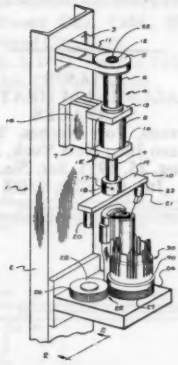
A relatively fail-safe fly-shuttle boxing detector for fly-shuttle weaving looms is disclosed. The apparatus provides automatic shut down of a loom if a fly-shuttle fails to box or if sensing switches fail either in the open or closed mode and utilizes the normally available warp stop voltage as a source of power. The electronic circuitry disclosed provides a voltage to a motor controller which enables the loom drive motor to continue to operate only if the fly-shuttle is boxed at a prescribed time in the loom cycle.

3,714,973

COIL TRANSFER AND STORAGE TOOL AND MACHINE FOR WINDING SAME

Vernon E. Kieffer, St. Louis, Mo., and Frank S. Korski, St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis County, Mo.

Filed Feb. 8, 1971, Ser. No. 113,198
Int. Cl. B21f 3/00
U.S. Cl. 140—92.1 18 Claims



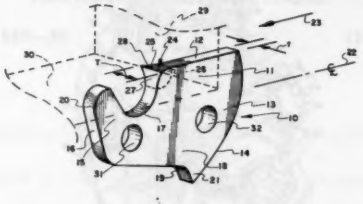
An apparatus for winding and a method for storing electrical coils used in the axial insertion of motor windings provides for placing the winding coil on a transfer and storage tool in a manner similar to that required for axial insertion. The tool is inverted and the coil is transferred to an axial insertion machine prior to placement in a stator core. The tool preferably is an injection molded plastic, form, with a series of blades arranged similarly to the blades of the axial inserter. While prewound coils may be placed on the tool manually, the apparatus of this invention winds successive coil throws and automatically places them on the transfer and storage tool.

3,714,974

CHAIN SAW CUTTING TOOTH AND METHOD FOR MAKING IT

Martin B. Bullard, 7111 Pomelo Drive, Canoga Park, Calif.

Division of Ser. No. 857,336, Sept. 12, 1969, Pat. No. 3,589,215. This application March 15, 1971, Ser. No. 124,109
Int. Cl. B27b 33/14
U.S. Cl. 143—135 R 7 Claims



A chain saw cutting tooth is fabricated by forming a laterally extending retaining hole through a portion of a metal plate and press-fitting a round-shaped carbide object into the retaining hole. After bonding metal has been deposited and hardened in the space defined between the carbide object and plate, sufficient material is removed by grinding for example from the carbide object, plate and bonding metal in order to construct a cutting tip.

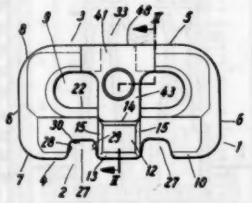
The plate may be integrally formed with a depth gauge and a drive tang.

3,714,975

CONNECTING LINK FOR TIRE ANTI-SKID CHAINS

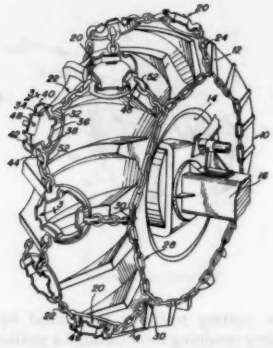
Anton Muller, Unterkochen/Wurttemburgh, Germany, assignor to Pistor-Kette GmbH, Wuppertal-Cronenberg, Germany

Filed Sept. 28, 1970, Ser. No. 75,925
Claims priority, application Germany, Sept. 26, 1969, P 19 48 718.4
Int. Cl. B60c 25/04
U.S. Cl. 152—243 10 Claims



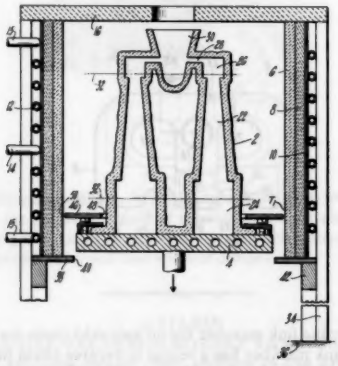
A connecting link member for an anti-skid chain for tires in which the link member has a recess to receive chain links and an opening in one side of the link member giving access to the recess. A closure member in the form of two jaws is clamped into said opening with the jaws in opposed relation and traversed by a clamping bolt. The closure member includes a portion extending across said recess to the other side of the link member and dividing the recess into two parts each adapted to receive a respective chain link.

3,714,976
TIRE CHAIN AND CONNECTOR
Robert H. Caldwell, 1042 W. State St., Jacksonville, Ill. 62650
Continuation-in-part of abandoned application Ser. No. 815,816, Apr. 14, 1969. This application Nov. 23, 1970, Ser. No. 91,797
Int. Cl. B60c 27/20
U.S. Cl. 152—228 **17 Claims**



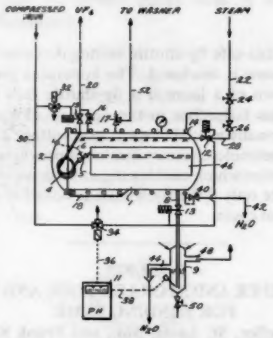
A tire chain having circumferentially spaced cleat members incorporated in a heavy duty linked chain device each spaced from each other on the tire tread, offset one from the other, and connected together by short links of chain. The alternate ones of the cleat members are connected in staggered relationship to side chains. The advantages of the assembly are increased traction for off-the-road equipment, ease of assembly and disassembly, adjustability, self-cleaning action, and prevention of chain wind-up and twisted or broken links.

3,714,977
METHOD AND APPARATUS FOR THE PRODUCTION OF DIRECTIONALLY SOLIDIFIED CASTINGS
Bruce E. Terkelsen, Cheshire, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed July 23, 1971, Ser. No. 165,619
Int. Cl. B22d 27/06
U.S. Cl. 164—60 **8 Claims**



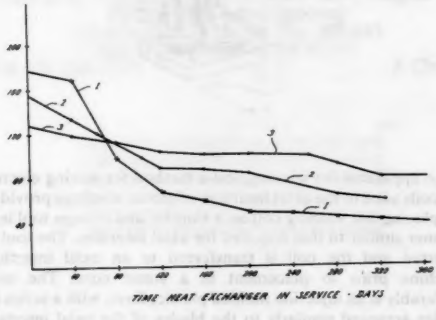
In making directionally solidified castings, a vertically movable radiation shield is supported in such a way that it may move upwardly with respect to the mold and the mold heater to permit upward movement of the mold and the supporting chill plate into the surrounding heater but upon retraction of the mold from the heater the radiation shield will be supported adjacent to the lower end of the heater and continued downward movement of the mold will withdraw the latter through the shield.

3,714,978
APPARATUS FOR HANDLING URANIUM HEXAFLUORIDE AT ELEVATED PRESSURE
Hans Pirk, Dornigheim, and Ulrich Tillessen, Grossauheim, both of Germany, assignors to Nukem Nuklear-Chemie und-Metallurgie, GmbH, Wolfgang near Hanau am Main, Germany
Filed April 21, 1970, Ser. No. 30,503
Claims priority, application Germany, May 14, 1969, P 19 24 595.5
Int. Cl. F28f 11/00
U.S. Cl. 165—1 **4 Claims**



The danger of UF_6 break out is eliminated by placing the container with the UF_6 in an outer container, heating the outer vessel with a condensible gas, catching the condensible gas and any UF_6 leakage, measuring the leakage with an indicating device, e.g. a pH instrument, shutting off the heating and closing the outer vessel when the indicating device exceeds a predetermined value.

3,714,979
CLEANING ALUMINUM HEAT EXCHANGE SURFACES
Clifford A. Stevens, Port Neches, Tex., assignor to Texaco Inc., New York, N.Y.
Filed Aug. 25, 1971, Ser. No. 174,590
Int. Cl. F28g 9/00
U.S. Cl. 165—1 **8 Claims**



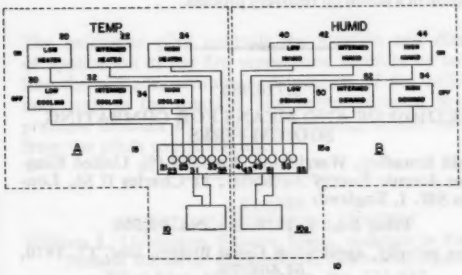
In a furfural refining process the average heat exchange capacity of an aluminum heat exchange surface

employed to transfer heat between process streams may be improved by cleaning relatively soft accumulated deposits from such surface in a manner such that thin, relatively hard deposits adjacent the heat exchange surface is substantially undisturbed.

3,714,980
AIR CONTROL SYSTEM

Frederick N. Lancia, Columbus, and Ralph C. Liebert, Worthington, Ohio, assignors to Liebert Corporation, Columbus, Ohio

Original application Aug. 29, 1968, Ser. No. 756,093. Divided and this application Mar. 16, 1970, Ser. No. 24,450
Int. Cl. F24f *3/14*
U.S. Cl. 165—11 **5 Claims**

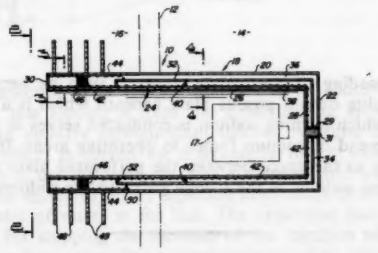


This invention relates to temperature and/or humidity electrical/electronic controls to maintain an enclosure at a constant temperature and humidity. Specifically, the electrical/electronic controls provide a step function to actuate one or more temperature and/or humidity conditioners in response to the degree of change.

3,714,981
HEAT SHIELD ASSEMBLY

Don W. Noren, Redwood City, Calif., assignor to Noren Products, Inc., Redwood City, Calif.

Filed Feb. 3, 1971, Ser. No. 112,360
Int. Cl. F28d *15/00*
U.S. Cl. 165—47 **4 Claims**

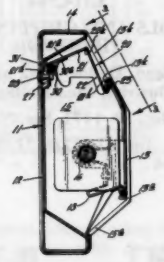


The specification and drawing disclose a heat pipe type of heat shield assembly comprising a double walled member positioned to extend between a high temperature area and a low temperature area and having a sealed inner-chamber. The outer face of one of the walls is adapted to face the high temperature area and wick material is positioned in engagement with the entire inner face of the other wall. A portion of the inner face of the wall exposed to the high temperature area is also covered with wick material and the remaining inner surface of the wall is bare. A partition member is positioned within the inner chamber. The partition member extends throughout the bare portion of the outer wall to reduce heat transfer by convection. Cooling fins are connected to the outer wall throughout at least the portion exposed to the lower temperature area.

3,714,982
CLEAN-OPERATING BASEBOARD HEATER

Charles S. Shriver, Oreland, Pa., assignor to Orbit Manufacturing Company, Perkasie, Pa.

Filed March 1, 1971, Ser. No. 119,563
Int. Cl. F24h *9/04*
U.S. Cl. 165—55 **11 Claims**

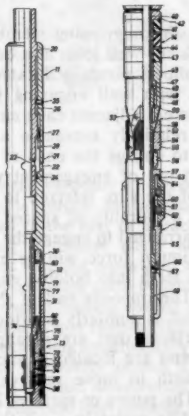


A baseboard heater is provided with diffuser means having a series of apertures for causing heated air to the exit therefrom in a series of discrete upwardly flowing columns spaced from the wall against which the heater is mounted to reduce the tendency for the heated air to deposit entrained foreign matter on the wall. Preferred dimensional relations are disclosed for the apertures in the diffuser means to ensure satisfactory performance of the heater.

3,714,983
RETRIEVABLE WELL PACKER

Gerald E. Wilson, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,992
Int. Cl. E21b *23/00*
U.S. Cl. 166—120 **8 Claims**



In accordance with an illustrative embodiment of the present invention, a retrievable well packer apparatus includes a body structure carrying expansible packing, slip and

expander means for anchoring against downward movement, and hydraulically operable gripping means to anchor against upward movement. In the event fluid pressures cannot be equalized in a typical manner to enable release of the packer, the body structure includes a first safety joint means that can be released to enable opening of a pressure equalizing valve means and the operation of tubular telescoping members as a jar or bumper sub. If this fails to release the hydraulically operable gripping means, the body also includes a second safety joint means that can be disconnected to enable release of the pipe string from the packer.

3,714,984

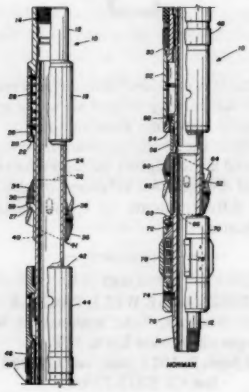
WELL TOOLS AND GRIPPING MEMBERS THEREFOR

Norman W. Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 20, 1971, Ser. No. 209,744

Int. Cl. E21b *23/06*

U.S. Cl. 166—134 **10 Claims**



An improved slip or gripping member that is used on well tools to lock the well tools at a desired location in a well bore. The slip is pivotally located on the well tool and is provided with wall engaging teeth on relatively opposite sides therein adjacent each end. The slip is positioned between relatively moveable abutments that are moved together to engage the ends of the slip and pivot the slip into and out of engagement with the well bore wall. One end of the slip, referred to as the active end, is provided with a plurality of spaced points or surfaces with each being arranged to engage the adjacent abutment whereby the optimum force will be exerted on the slip to move the slip teeth into holding engagement with the well bore wall. The opposite end of the slip, referred to as the passive end, is similarly provided with a plurality of points or surfaces that are arranged to engage the other abutment and are located in such a position as to cause the slip teeth to move relatively away from the well bore wall. The points or surfaces on each end of the slip are arranged to maintain a relatively constant ratio between the distance from each operative points on the active and passive ends and the adjacent well bore wall thereby permitting the predetermination of the force that is exerted on the slip during setting of the well tool.

3,714,985

STEAM OIL RECOVERY PROCESS

Jack H. Bayless, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed Sept. 1, 1971, Ser. No. 177,124

Int. Cl. E21b *43/24*

U.S. Cl. 166—303 **10 Claims**

Disclosed herein is a method for recovering oil from a subterranean oil bearing formation using steam. The steam is generated from water which has been treated to reduce the concentration of scale forming anions and to retain substantially all of the scale forming cations. The generated saturated steam has a gaseous phase and a liquid phase which contains scale forming cations, such as magnesium and calcium, and which is substantially free of scale forming anions, such as carbonate, bicarbonate, and sulphate. The steam including the cation-containing liquid phase is injected into the oil bearing formation in a steam oil recovery process.

3,714,986

METHOD OF AND MEANS FOR COMBATING SODIUM FIRES

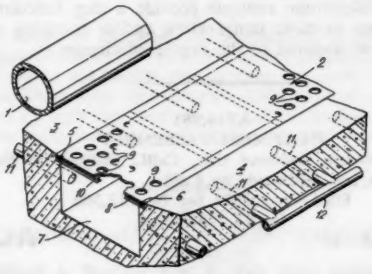
Donald Broadley, Warrington, England (% United Kingdom Atomic Energy Authority, 11 Charles II St., London SW. 1, England)

Filed Dec. 7, 1970, Ser. No. 95,560

Claims priority, application Great Britain, Dec. 17, 1970, 61,606/70

Int. Cl. A62c *1/00*

U.S. Cl. 169—1 A **7 Claims**



Spreading of particulate material such as vermiculite or perlite onto a porous plate beneath which is a trough into which burning sodium is conducted serves to prevent the spread of sodium fumes to operating areas. Inert gas supply to the space between the perforated plate and the burning sodium in the trough puts out the sodium fire.

3,714,987

HELICOPTER SUPPORTED AERIAL FIRE SUPPRESSANT APPLICATOR

Larry L. Mattson, 3624 164th Place SE., Bellevue, Wash. 98008

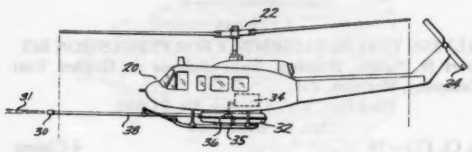
Filed May 17, 1971, Ser. No. 143,995

Int. Cl. A62c *3/02*; B64d *1/16*; B05b *17/02*

U.S. Cl. 169—2 A **6 Claims**

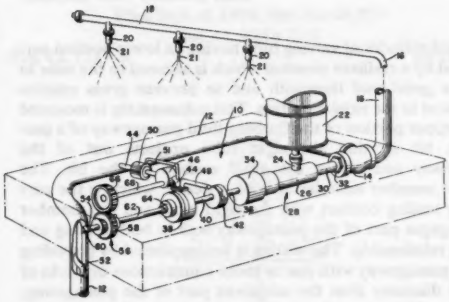
A helicopter-transported fire suppression system and method is described wherein a fire suppression medium such as water, aqueous foam, slurries and the like are

accurately directed to the precise location of a fire or to a portion of a fire to be treated by projecting a coherent stream of the fire suppression medium outwardly from the fire suppression system by locating a nozzle means beyond the effective area of helicopter rotor downwash to avoid interference with the stream by the downwash.



The helicopter pilot controls the location and direction of application of the fire suppression medium by controlling the altitude, attitude and location of the helicopter and controls the quantity and composition of fire suppression medium by actuating pumping means therefore from the pilots control station.

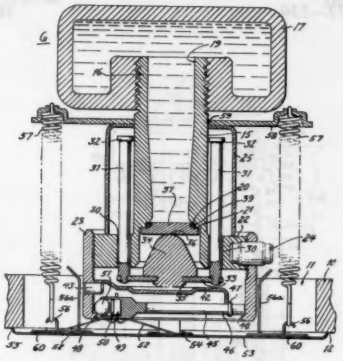
3,714,988
ADDITIVE INJECTION SYSTEM
William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.
Filed Mar. 18, 1971, Ser. No. 125,635
Int. Cl. A62o *35/00*
U.S. Cl. 169—13 **8 Claims**



An injection apparatus for introducing an additive into a fluid line feeding a fixed fire extinguishing system to form an ablative extinguishant therein. A pump is provided which is driven by a hydraulic motor using the fluid as a driving medium, and a servomechanism controls the motor to insure injection rates corresponding to flow rates of water in the line. The apparatus includes a device for stopping the increase of the injection with increasing flow rates after a predetermined flow rate is attained.

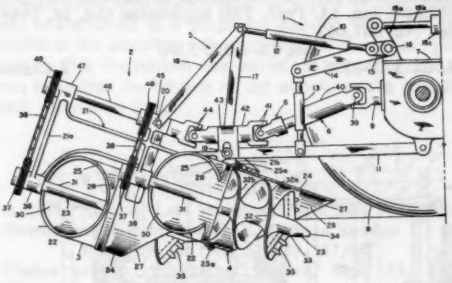
3,714,989
FLUSH TYPE SPRINKLER
Fred A. Gloeckler, Huntingdon Valley, Pa., assignor to Star Sprinkler Corporation of Florida, Philadelphia, Pa.
Continuation-in-part of application Ser. No. 24,596, Apr. 1, 1970, now Patent No. 3,633,676. This application June 7, 1971, Ser. No. 150,474
Int. Cl. A62c *37/06, 37/12, 37/30*
U.S. Cl. 169—19 **5 Claims**

A sprinkler is provided mounted flush in a ceiling and has an overlapping outer escutcheon plate releasably held in place by resilient upwardly extending members connected to the escutcheon plate by heat responsive elements. The escutcheon plate is normally secured in covering relation to the sprinkler which has a strut containing a heat responsive element with a different selected



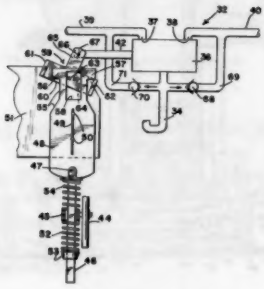
heat release temperature. Heat sensing fins in contact with the escutcheon plate are movable downwardly below the ceiling line to an exposed position upon release of the plate and thereby increase the sensitivity of the strut heat responsive element.

3,714,990
AUGER PLOW
George A. Tomik, Willow Hill Farm, Peotone, Ill.
Filed Nov. 12, 1970, Ser. No. 88,636
Int. Cl. A01b *33/04*
U.S. Cl. 172—58 **9 Claims**



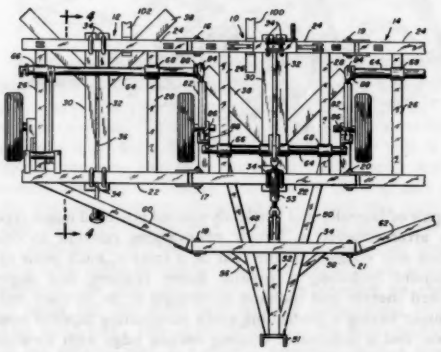
A pair of laterally and vertically spaced powered auger type plow arrangements in furrow overlapping relation to one another and coupled to the rear of a tractor, each plow arrangement including a tubular auger housing and auger disposed therein and inclined downward at its forward end, the auger having a protruding earth penetrating tapered nose portion and a removable leading cutting edge with forward scarifiers thereon spaced just rearwardly of the nose portion and an auger shaft extending longitudinally in the housing and having a plurality of rearwardly located screw lead portions, the housing having a forward downwardly rearwardly sloped flat portion and an elliptical inlet opening therein and having laterally rearwardly curved rear end portion having adjustable discharge opening whereby the earth is scooped into the front of each arrangement and discharged out the rear and upwardly therefrom propelling the plow arrangements forwardly in aid of the motive power of the tractor.

3,714,991
ALTERNATING MECHANISM FOR HYDRAULIC MARKERS
Donald E. Rieser, Wheaton, Ill., assignor to International Harvester Company, Chicago, Ill,
Filed Feb. 26, 1971, Ser. No. 119,274
Int. Cl. A01b 17/00
U.S. Cl. 172—130 16 Claims



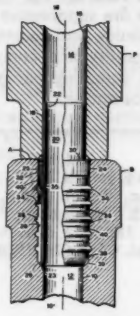
In a planter vertically movable between operating and transport positions and having alternately operating right and left hand markers raised and lowered by hydraulic cylinders, a hydraulic circuit is provided wherein fluid under pressure is directed to one of the marker cylinders to raise the operating marker when the planter is raised, and alternator valve means in the circuit is shiftable between two positions by the vertical movement of the planter to alternately lower the markers when the planter is lowered.

3,714,992
STUBBLE MULCHER DEVICE
Leon G. Meier, P.O. Box 94, Higgins, Tex. 79046
Continuation-in-part of abandoned application Ser. No. 608,604, Jan. 11, 1967. This application Oct. 20, 1969, Ser. No. 867,603
Int. Cl. A01b 5/00
U.S. Cl. 172—175 2 Claims



A sweep blade plow assembly for tilling the soil utilizes V-shape sweep blades operating at relatively shallow depths below the earth's surface. The sweep blades are carried on and supported by a central frame member and side frame members pivotally attached to the central member. The depth of the blade's cut is controlled by wheels attached to the frame members, and vertically pivotal relative to the blade. The wheels on the various sections are interconnected to each other and to a unitary control switch for simultaneous vertical movement. Turnbuckles used in the interconnection permit depth adjustment even when one or more of the pivotal side sections is pivoted upwardly into a vertical inoperative position. Secured to the plow assembly rearward of the blade plows are toothed discs rotatably journaled on a pivotal shaft.

3,714,993
VALVING TUBE SUBASSEMBLY FOR PERCUSSION BIT
Robert H. Nolley, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.
Filed Nov. 23, 1970, Ser. No. 91,699
Int. Cl. E21b 1/00
U.S. Cl. 173—78 4 Claims



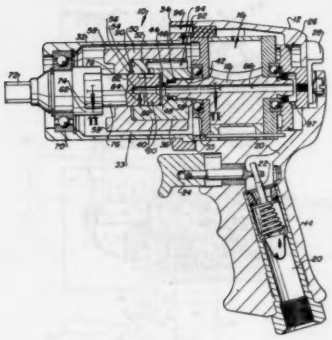
A rigid cylindrical valving tube having its lower portion surrounded by a resilient member which is secured to the tube to effect a good seal therewith and to prevent gross relative movement in the axial direction. This subassembly is mounted in the upper portion of the flushing fluid passageway of a percussion bit so that the rigid tube projects out of the passageway and above the anvil surface of the bit. The resilient member includes at least a sleeve, which is the part making sealing contact with the rigid tube, and the member also engages part of the passageway wall in both sealing and seating relationship. The seating is accomplished by providing the bit passageway with one or more constrictions or necks of smaller diameter than the subjacent part of the passageway, and by making parts of the resilient members with a diameter larger than that of the contriction—so that after squeezing such part of the resilient member past the neck it will fit under the constriction and be restrained thereby.

The assembly furnishes lateral as well as axial freedom of motion to the valving tube, enabling it to make the small but important shifts in position which are necessary to accommodate small and usually transient misalignments between hammer and bit, misalignments which otherwise could result in destruction of the tube by the rapidly moving hammer. The shape of the subassembly also makes field insertion simple and practicable.

3,714,994
FLUID ACTUATED IMPACT MECHANISM
Richard L. Zoerner, Marne, and Larry D. Ruiter, Grand Haven, Mich., assignors to Gardner-Denver Company, Quincy, Ill.
Filed Nov. 29, 1971, Ser. No. 202,925
Int. Cl. B25d 15/00
U.S. Cl. 173—93 9 Claims

A rotary fluid actuated mechanism for an impact wrench including a rotary drive member coupled to a rotating hammer member through a pin and slot coupling

which provides for rotary and axial displacement of the hammer with respect to the drive member. The hammer is mounted in sleeved arrangement over the drive member to form an expansible chamber. Pressure air is supplied to the chamber through a rotary valve formed by the drive member and a portion of a rotary anvil for forcing the hammer to move axially and accelerate rotatively to impact the anvil.



3,714,995

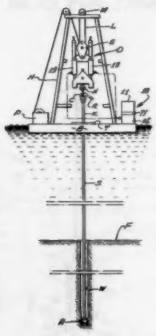
MOTION COMPENSATING APPARATUS

James W. E. Hanes, Ventura, Calif., and Edward Larralde, Santa Barbara, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Sept. 4, 1970, Ser. No. 69,759

Int. Cl. E21b 7/12

U.S. Cl. 175—5 **24 Claims**



Compensating apparatus connected between a travelling block of a well bore rig mounted on a vessel float in a body of water and a hook from which a running string is supportable, the compensating apparatus including a pair of elongate cylinders straddling and connected to the travelling block and a pair of companion piston rods connected to and straddling the hook and secured to pistons relatively longitudinally shiftable in the cylinders, liquid under pressure being maintained in the cylinders under the pistons to support a substantial portion of the weight of the running string suspended from the hook. The compensating apparatus can be rendered inoperative when desired. Shock absorbers retard sudden upward movement and retraction of the compensating apparatus in the event of sudden release or diminution of the load on the apparatus, as might result from failure of the running string.

3,714,996

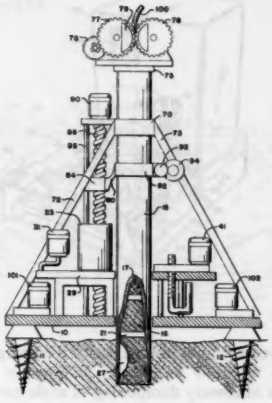
UNDERSEA CORING MACHINE WITH MEANS FOR SEPARATING SAMPLES

Ernest Blaney Dane, Jr., 57 Tyler Road, Belmont, Mass. 02178

Filed Aug. 10, 1971, Ser. No. 170,455

Int. Cl. E21b 7/12; E21c 19/00

U.S. Cl. 175—6 **10 Claims**



The machine, intended for operation at ocean depths up to several miles, comprises a generally triangular platform with a motor-operated auger at each corner by which it may be attached to the ground, and a centrally situated coring tube with which are associated means for raising and lowering the tube, and means for inserting plastic spacers between successive samples. The whole is connected by a cable to a ship. The tube is driven and withdrawn by operation of an eccentric vibrator coacting with a biasing lead screw and flexible strut. A supply of saucer-like disks is contained in a magazine situated vertically and parallel to the sampling tube, and transfer means are provided to slide the bottom disk out of the magazine, and to press it up into the bottom of the sampling tube past the check valve in its foot.

3,714,997

WEIGHING DEVICE

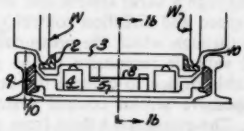
Nils Goran Ahl, and Lars Herbert Larsson, both of Vasteras, Sweden, assignors to Conrail AB, Vasteras, Sweden

Filed Sept. 16, 1971, Ser. No. 181,047

Claims priority, application Sweden, Sept. 21, 1970, 12802/70

Int. Cl. G01g 19/08

U.S. Cl. 177—136 **21 Claims**



A weighing device comprising a frame extending between and supported by a pair of rails for movement therewith, a load supporting platform adapted to engage the wheels of a railway guided vehicle and a plurality of load sensing means supporting the platform on the frame.

3,714,998

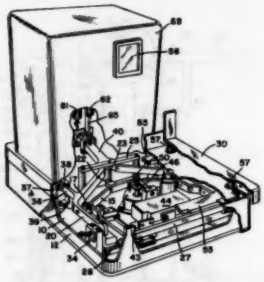
WEIGHING SCALE WITH IMPROVED DASH POT

Kenneth C. Allen, and Edwin E. Boshinski, Dayton, Ohio, assignors to The Hobart Manufacturing Company, Troy, Ohio

Filed Feb. 4, 1971, Ser. No. 112,588

Int. Cl. G01g 23/08

U.S. Cl. 177—189 3 Claims



An improved dash pot for use with a weighing scale allows a scale platter to move to a balance position quickly while providing the necessary dampening of scale movement which will permit accurate reading of an indication representing the weight placed on the platter. The dash pot includes a cylinder containing a liquid and a plate mounted to move within said cylinder in response to platter movement. The plate is provided with openings which are closed by leaf springs until the force exerted on the plate by the liquid increases above a predetermined magnitude at which time the valve opens, allowing a more rapid transfer of liquid from one side of the plate to the other thus permitting the platter to move quickly to a new position. When the platter reaches the new balance position, the valves close and more effective dampening of minor movements of the platform is then provided by the dash pot. Different size openings and/or leaf spring thicknesses and tensions may be provided to control the speed of movement of the platter in opposite directions.

3,714,999

HYDROSTATIC DRIVE FOR VEHICLE

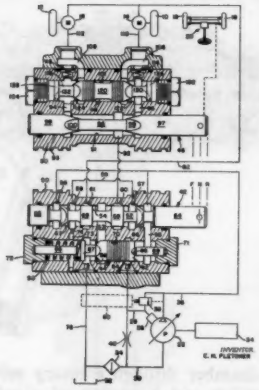
Edward Horton Fletcher, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 29, 1971, Ser. No. 110,852

Int. Cl. B62d 11/04

U.S. Cl. 180—6.48 12 Claims

A vehicle has a pair of rear drive wheels respectively driven by a pair of hydraulic motors and a pair of steerable front wheels. The hydraulic motors are driven by fluid pressure supplied by a variable displacement hydraulic pump through a valve system that includes a manually shiftable speed and direction control valve having a variable orifice through which the pressurized fluid flows. A flow control valve is responsive to the pressure drop across the variable orifice to control the flow of fluid to a pressure responsive stroke control system associated with the pump. The pressurized fluid from the speed and direction control valve is delivered to the respective motors through a flow divider valve actuated by the steering mechanism to throttle the flow of fluid to the wheel motor on the inside of the turn. The fluid also flows through a differential control valve which operates to restrict the fluid flow to the motor having the lesser load and consequently the lesser pressure, providing a limited slip differential action. The flow control valve is



also connected to the return line to provide dynamic breaking after it causes the pump to go out of stroke.

3,715,000

ENGINE POWERED JUMPING STICK

Herbert J. Ottaway, 3702 Elmwood Drive, Wichita, Kans. 67218

Filed May 21, 1971, Ser. No. 145,822

Int. Cl. B62d 57/00

U.S. Cl. 180—8 R 4 Claims

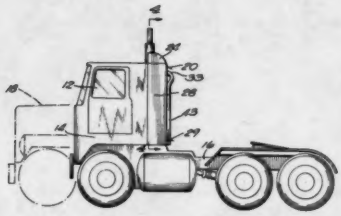
A jumping stick of the type including a downwardly extensible ground-contacting plunger that is spring urged toward its extended position together with an improved two-stroke cycle internal combustion engine having its piston movable with the plunger and arranged on its power stroke to urge downward extension of the plunger.

3,715,001

ENGINE COOLING SYSTEM FOR VEHICLES

Harry R. Wilson, Milwaukee, Wis., assignor to McQusy-Perfex Inc.

Filed June 4, 1970, Ser. No. 43,367
Int. Cl. B60k *11/04*
U.S. Cl. 180—68 R 12 Claims



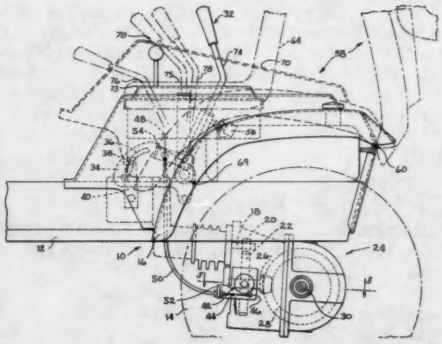
This invention comprises a self-contained engine cooling system for a vehicle. This cooling system has a housing with an air inlet near the top of the housing and an air outlet located below the air inlet in a generally vertical direction. A radiator and one or more air circulators for moving air past the radiator are located within the housing and between the air inlet and air outlet. This self-contained engine cooling system is adaptable particularly for behind the cab mounting on trucks and similar vehicles.

3,715,002

SUBURBAN TRACTOR AND CONTROLS

Lawrence M. Halls, New Holland, Pa., and Shaun A. Seymour, Lebanon, Ohio, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Oct. 5, 1970, Ser. No. 78,138
Int. Cl. B60k *27/08*
U.S. Cl. 180—82 3 Claims



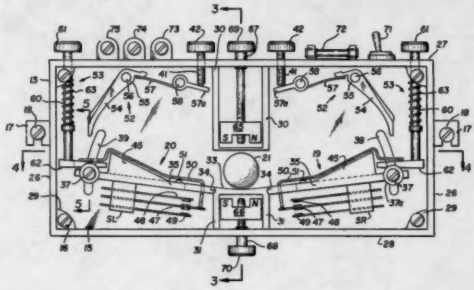
A surburban tractor having a transmission control lever moveable between park and drive positions cooperatively related to a rear pivotable deck, a starter switch, and a parking lock. The control is so structured and orientated that when in the drive position the starter switch is open, the parking lock disengaged, and the rear deck is substantially prohibited from pivotable movement. In the park position the starter switch is closed, the parking lock engaged, and the rear deck is free to be pivoted.

3,715,003

TRAILER ANTIFISHTAIL CONTROL SYSTEM

Arthur R. Jubenville, 20 Grist Mill Lane, Halesite, N.Y. 11743

Filed Oct. 15, 1970, Ser. No. 80,834
Int. Cl. B60t *7/20*
U.S. Cl. 180—103 34 Claims



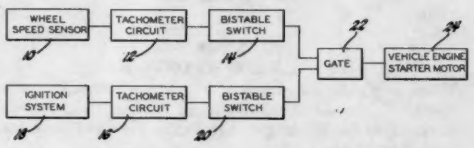
A towed vehicle antifishtail control system in which a ferromagnetic ball functions as an acceleration sensing body and is movable in response to lateral acceleration of the towed vehicle, from a central rest position to either side relative to the inclined branches of a path provided by ramp assemblies which preferably are movably mounted. Magnetic apparatus is provided for adjustably biasing the ball to hold it in its rest position. Movement of the ball along either path branch results first in actuation of a warning device and then actuation of the towed vehicle's brakes. Apparatus is also disclosed for releasably trapping the ball at either extremity of its path.

3,715,004

AUTOMATIC ENGINE CRANKING SYSTEM

James E. Pasek; Frederick L. J. Rehfeld, both of Saginaw, and William B. Thompson, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 176,813
Int. Cl. B60k *27/00*
U.S. Cl. 180—103 1 Claim



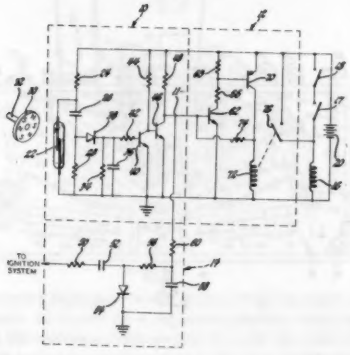
A system for energizing the vehicle engine starter motor when the vehicle engine stalls while the vehicle is at a speed greater than a predetermined minimum so as to maintain the operation of the vehicle driven accessories while the vehicle speed is greater than the predetermined minimum and to maintain the requirement of manual start while the vehicle is at rest.

3,715,005

AUTOMATIC CRANKING SYSTEM FOR PROVIDING POWER ASSIST UPON VEHICLE ENGINE STALL

Robert J. Byram, Grand Blanc; Mark N. Culver, Davison, and David L. Van Ostrom, Flint, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 176,814
Int. Cl. B60k *13/00*
U.S. Cl. 180—103 **2 Claims**



A system for energizing the vehicle engine starter motor when the vehicle engine stalls while the vehicle is at a speed greater than a predetermined minimum so as to maintain the operation of the vehicle engine driven accessories. A vehicle speed switch maintains the output of a summing junction, which output constitutes the input to a power switch, at ground so as to inhibit the power switch when the vehicle speed is below the predetermined speed and switches to supply a positive current signal to the summing junction at speeds equal to or greater than the predetermined speed. A vehicle engine speed tachometer supplies a negative current signal to the summing junction having a magnitude related to engine speed. The net current output of the summing junction when the vehicle engine speed is at or above the minimum engine idle speed, is insufficient to energize the power switch. When the engine speed decreases below the minimum idle speed, the net current output of the summing junction increases to energize the power switch which in turn energizes the vehicle starter solenoid. The vehicle starter motor cranks the vehicle engine so as to maintain the operation of the engine driven accessories while the vehicle speed is above the predetermined minimum speed.

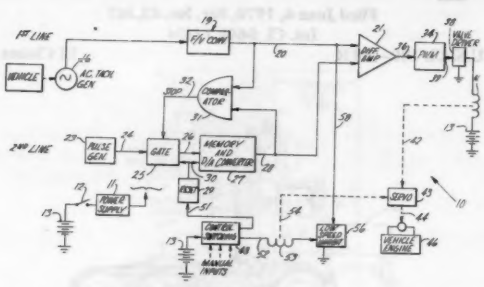
3,715,006

VEHICLE SPEED CONTROL

William J. Walsh, Birmingham; Joseph A. Livers, Roseville; Robert S. Mueller, Southfield, and Warren R. Hill, Dearborn, all of Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed April 3, 1969, Ser. No. 813,038
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 E **27 Claims**

A device for automatically maintaining the speed of an automotive vehicle at, or substantially at, any currently existing value when same is suitably selected by the operator. The apparatus comprises means for remembering and producing a signal proportional to the speed of the vehicle at the moment the control mechanism is activated by the operator. It further comprises means for producing a signal proportional to a subsequent instantaneous speed of the vehicle. Said signals are then compared and caused to alter proportionately the duty



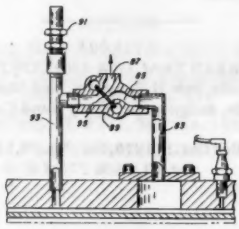
cycle of an oscillator output. Such variations in said duty cycle are then utilized to control the vehicle throttle in a manner to adjust the speed toward the selected valve.

3,715,007

GAS CUSHION CONTROL FOR SEISMIC GAS EXPLODER

Gilbert H. Kelly, Irving, and Herbert D. Coburn, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 5, 1970, Ser. No. 77,767
Int. Cl. G01v *1/10*
U.S. Cl. 181—.5 NC **17 Claims**



Disclosed is a seismic gas exploder in which the exhaust system is controlled to cause the retention of exhaust gases in a pressurized volume within the body of the exploder. This volume of gas then acts as an energy absorbing cushion or shock absorber against which the gas exploder can bounce and rebound without injecting unwanted secondary shock energy into the ground. Retention of the exhaust gases in this manner allows near peak pressure to be developed from a charge.

3,715,008

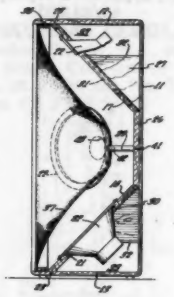
LOUDSPEAKER CABINET ASSEMBLY AND METHOD

Seth E. Lover, Garden Grove, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Jan. 31, 1972, Ser. No. 221,930
Int. Cl. G10k *13/00;* **H04r** *1/28*
U.S. Cl. 181—31 B **25 Claims**

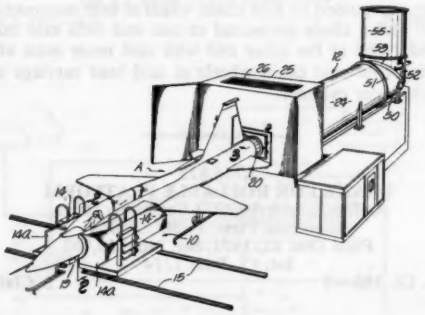
An extremely rigid and acoustically-excellent, yet low-cost, loudspeaker cabinet assembly is formed by combining two trapezoidal speaker baffles with two triangular speaker baffles. Such baffles, with their associated speakers, are mounted in inclined manner in a rectangular cabinet and are braced by triangular braces which connect from adjacent edges of the baffles to the back of the cabinet. The braces do not extend outwardly to the cabinet corners, so that the chambers defined behind the baffles are in communication with each other. The baffle edges, at regions between the braces and the cabinet

corners, are spaced from each other to form ports for the speakers. Elastic knit grill cloth is stretched over the cabinet front and is centrally depressed by means of a connector member, the result being a highly attractive horn-shaped configuration.



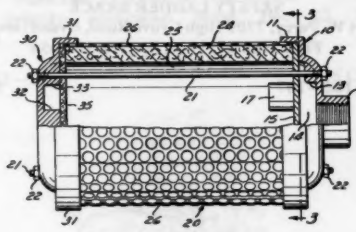
In accordance with the method, the baffles are mounted individually. The braces are then inserted through speaker openings in the baffles, and are slid radially inwardly as far as permitted by the baffles. Loudspeakers are then front-mounted on the baffles, and the grill cloth is mounted and stretched.

3,715,009
JET ENGINE NOISE SUPPRESSION SYSTEM
Cloyd D. Smith, Pacific Palisades, and James H. Schmidt, Berkeley, both of Calif., assignors to General Acoustics Corporation, Los Angeles, Calif.
Continuation-in-part of Ser. No. 766,910, Oct. 11, 1968, Pat. No. 3,525,418. This application Aug. 17, 1970, Ser. No. 64,494
Int. Cl. B64d *33/06*; F01n *1/14, 7/18*
U.S. Cl. 181—33 HC **5 Claims**



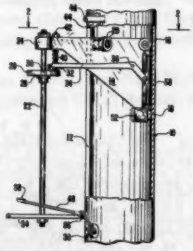
A noise suppression system for testing jet engines includes both an intake silencer and an exhaust noise suppressor. The latter is designed to remove energy from the exhaust gases by cooling them quickly and to this end provides an acoustical tubular shell with a removable liner which provides a water-cooled coil for absorbing thermal energy from the gases. The coil is part of a water circulation system which includes a cooling tower or other means through which the water is circulated to cool it, thereby permitting operation of the system over an extended period of time. At the anterior end of the shell is a housing having a sonically sealable opening which receives the tail pipe of the jet engine. This housing provides also a tortuous intake passageway for secondary air, which is fed to a concentric augmenter tube extending into the anterior end of the shell.

3,715,010
MULTIPLE COLLIMATOR MUFFLER
Stephen J. Gibel, 5846 Edgerton Road, North Royalton, Ohio 44133
Filed Feb. 2, 1972, Ser. No. 222,876
Int. Cl. F01n *1/10*
U.S. Cl. 181—50 **8 Claims**



Muffler for pneumatic exhausts, particularly exhausts at supersonic velocities. Muffler comprises a primary expansion chamber and secondary silencing chamber; air from the primary chamber passes through a plurality of collimating nozzles into the secondary chamber, from which the air is disseminated through a porous wall of acoustical material. The nozzles and the structure supporting them appear to break up ultrasonic shock waves and dissipate some of their energy in the primary chamber. Interference between jets of air entering the secondary chamber through the nozzles additionally dissipates sound energy. Further dissipation is obtained by impingement of the jets against and passage through acoustical material constituting internal wall surfaces of the secondary chamber.

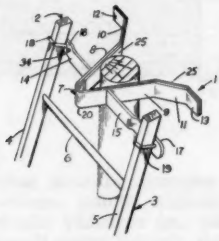
3,715,011
GRAVITY ESCAPE MEANS
Alfred G. B. Prather, 5700 Lincoln Ave., P.O. Box 53, Lanham, Md. 20801
Filed Apr. 10, 1972, Ser. No. 242,404
Int. Cl. A62b *1/20*
U.S. Cl. 182—100 **10 Claims**



The post extends upwardly from the ground level alongside of a building to one or more windows of the floors above the ground, and provides opposed tracks for roller and brake means of the portable carriers placed near the windows for use of occupants of those floors to lower themselves to the ground in case of fire or other imminent danger. In an emergency, the occupants can easily escape through said windows by each one seizing a carrier and mounting it on the post and releasing the brakes from the platform of the carrier carefully to lower himself or herself, with due regard for other carriers at lower levels, to the ground or other safe level, where the carriers are removed from the post to permit other escapees to follow and make their escape.

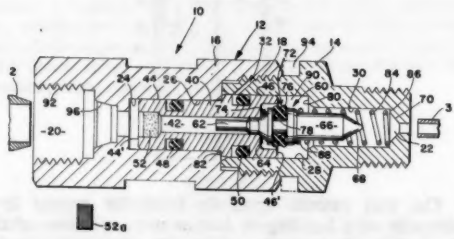
A pulley system may be used for automatically returning the removed carriers back to their original floors by means of a counter-balance slightly heavier than the carrier.

3,715,012
SAFETY LADDER BRACE
Adelbert W. Perry, 7709 High Grove Road, Grandview, Mo.
Filed Sept. 27, 1971, Ser. No. 184,054
Int. Cl. E06c 7/48
U.S. Cl. 182—107 **8 Claims**



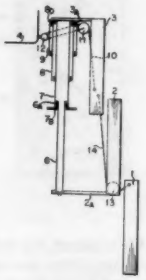
A safety device for supporting an upper end portion of a ladder having a pair of side rails joined by rungs wherein the safety device includes a body member having a pair of diverging arms forming a generally V-shape, each having an extension with the extensions being in substantially normal planes and a flange extending outwardly from a free end of each of the extensions with the flanges being substantially coplanar and a wing extending outwardly from each of the diverging arms and having a portion engageable with a respective side rail of the ladder and a clamping member on each wing for securing the respective side rails of the ladder thereto.

3,715,013
LUBRICANT INJECTOR
William Lyth, Cleveland, and Roy Smith, Washington Court House, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio
Filed Aug. 19, 1971, Ser. No. 173,169
Int. Cl. F16n 25/00
U.S. Cl. 184—7 D **28 Claims**



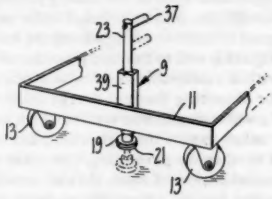
A lubricant meter valve of the injector type comprising a generally cylindrical body having a central axial cavity therethrough and a slidable differential-area piston therein. The piston has an axial bore therethrough and carries a forwardly opening poppet which is spring biased to a closed position. The application of pressure lubricant to the inlet side of the cavity is effective to first move the piston and poppet forwardly injecting lubricant out the outlet and then to unseat the poppet, closing the outlet and allowing lubricant to flow through the piston bore forcing the piston backwardly thus recharging the meter valve.

3,715,014
INDUSTRIAL TRUCK
Shuji Ohta, Toyohashi, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Aichi Prefecture, Japan
Filed Mar. 16, 1971, Ser. No. 124,781
Claims priority, application Japan, Mar. 18, 1970, 45/23,257
Int. Cl. B66b 9/20
U.S. Cl. 187—9 **1 Claim**



An industrial truck of the type of so-called full free triple stage uprights or masts, comprising an outer mast, an intermediate mast vertically movable relative to said outer mast, an inner mast vertically movable relative to said intermediate mast, a load carriage vertically movable relative to said inner mast, a second ram connected with said inner mast, an inner cylinder concentrically arranged within said second ram, a first ram engaging concentrically with the outer side of said second ram, an outer cylinder concentrically engaging with the outer side of said first ram, chain wheels rotatably supported by said outer cylinder, and intermediate mast and said load carriage respectively, a chain of which one end and other end being mounted on said outer mast and said inner mast respectively and guided by said chain wheel at said intermediate mast, and a chain connected at one end with said outer cylinder and at the other end with said inner mast after passing over said chain wheels at said load carriage and at said outer cylinder.

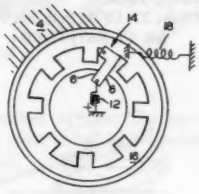
3,715,015
BRAKE FOR ROLLABLE PLATFORM
Arthur L. Morris, 1031 Crestview Drive, Mountain View, Calif. 94040
Filed Dec. 22, 1971, Ser. No. 210,702
Int. Cl. B60t 1/14
U.S. Cl. 188—5 **3 Claims**



A brake for a rollable platform is provided which consists of a simple lever actuated pad adapted to hold

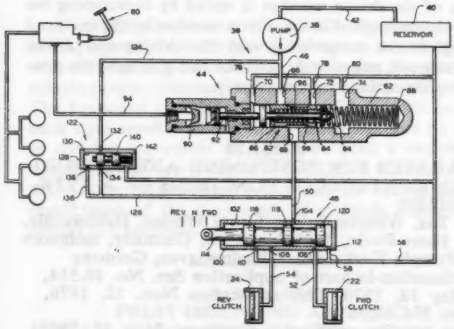
the platform on level or irregular surfaces and independent of the wheels.

3,715,016
ROTATIONAL RATE REGULATOR
Marcus A. Frieder, Tenafly, N.J., assignor to The Bendix Corporation
Filed Sept. 29, 1970, Ser. No. 76,353
Int. Cl. F16d *59/00*
U.S. Cl. 188—184 **1 Claim**



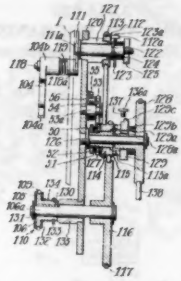
Means including an element pivotally mounted to a rotating member and effected by the rotational rate of the member above a predetermined limit for pivoting to engage a stationary member whereby a force for restraining rotation is generated.

3,715,017
INCHING VALVE WITH BYPASS VALVE FOR FILLING CLUTCHES
Asa R. Jenney, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Oct. 30, 1970, Ser. No. 85,537
Int. Cl. B60k *29/02*; **F16d** *67/04*
U.S. Cl. 192—4 A **3 Claims**



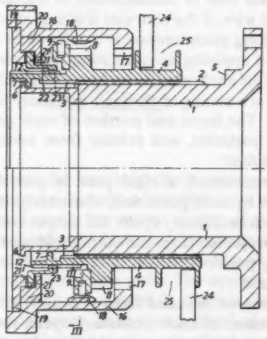
A system for controlling gradual engagement and disengagement of the forward and reverse clutches of a fluid power shifted transmission. The system includes a pump for supplying pressurized fluid to the clutches via a pressure regulating valve responsive to brake actuation and a clutch selector valve. Connected between the pump and selector valve is a normally open valve which bypasses the regulator valve and is operable to close when the pressure of fluid being supplied to the selector valve rises above a predetermined pressure.

3,715,018
CLUTCH ENGAGING AND DISENGAGING DEVICES
Tatsusuke Kadowaki, Midori-ku, Yokohama-shi, Kanagawa-ken, and Makoto Kurasawa, Sumida-ku, Tokyo, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Dec. 17, 1970, Ser. No. 99,074
Claims priority, application Japan, Dec. 22, 1969, 44/122091
Int. Cl. F16d *11/06*
U.S. Cl. 192—24 **5 Claims**



A clutch includes an axially fixed member and an axially movable member arranged coaxially of each other for interengagement. The rotatable axially movable member has a rib projecting from its circumferential periphery and inclined to the generating line of the periphery. A pin is mounted on the end of a pivoted lever and extends toward the periphery of the axially movable clutch member, and may be moved into engagement therewith to engage a side surface of the rib. When the pin engages the side surface of the rib, the rotatable clutch member is displaced axially to disengage the axially fixed clutch member. The opposite side edge of the rib preferably is bevelled, and spring means may be provided to bias the axially movable clutch member in a direction opposite to the direction of displacement thereof by engagement of the pin with the rib.

3,715,019
SYNCHRONOUS SELF-SHIFTING CLUTCHES
Robert Howard Heybourne, East Molesey, Surrey, and Herbert Arthur Clements, Oatlands Park, Weybridge, Surrey, both of England, assignors to S.S.S. Patents Limited, London, England
Filed May 3, 1971, Ser. No. 120,425
Claims priority, application Great Britain, March 11, 1970, 11,614/70
Int. Cl. F16d *23/08*
U.S. Cl. 192—67 A **10 Claims**



In pawl and ratchet mechanism capable of being set selectively to a pawl free condition or to a ratcheting condition,

baulking means are provided which operate in response to relative rotation of the pawls and ratchet teeth to permit or prevent a change from the pawl free condition to the ratcheting condition according to whether the direction of relative rotation is appropriate or inappropriate for the change to be made.

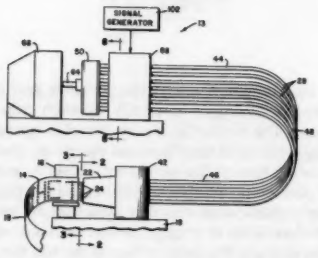
The invention is applicable to toothed clutches wherein pawl and ratchet mechanism is employed for automatically aligning the clutch teeth for interengagement.

3,715,020

WIRE RECORDING AND MECHANISM THEREFOR

Robert W. Nordin, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Sept. 21, 1970, Ser. No. 73,938
Int. Cl. B41j *5/00*
U.S. Cl. 197—1 R **17 Claims**



A flexible wire with an input end and an output end extends through an arcuately bent tubular guide that has an input end portion, an output end portion and an arcuate connecting section. The output end portion of the guide is relatively secured. Its input end portion is mounted for movement longitudinally of the guide.

A restraint is arranged about the input end portion of the guide and has a first condition in which said input end portion is secured from moving and a second condition in which the output end portion is free from restraint to permit guide movement.

The wire and guide are proportioned such that a force applied to the input end of said wire axially thereof will (1) cause the wire to slide through and thereby project the output end of said wire from the output end portion of the guide, if the restraint is in said first condition; and (2) cause the guide to extend at its arcuate section in a direction away from the output end of said wire in consequence of frictional coupling of the guide and wire, if the restraint is in said second condition.

This switching phenomenon is employed in a recorder having means for applying an oscillating force simultaneously to an input end of each wire in an array of flexible wires which respectively are arranged through arcuately bent flexible tubular guides. The input end portion of each guide is arranged for selective restraint, and release from restraint, in a fixed position such that:

1. when restrained, a rigid path is provided for the associated wire by such guide and, alternately during respective phases of each oscillatory cycle, the output end of the wire will be (a) first projected from the output end portion of the guide into printing position relative a record carrier, and (b) then withdrawn; and

2. when free or released from restraint, alternately during respective phases of each oscillatory cycle, such guide and its associated wire (a) first become frictionally coupled and bend to cause elongation of intermediate portions thereof which are remote from the output end of the wire, thereby to prevent its projection into printing position, and (b) then return to original position.

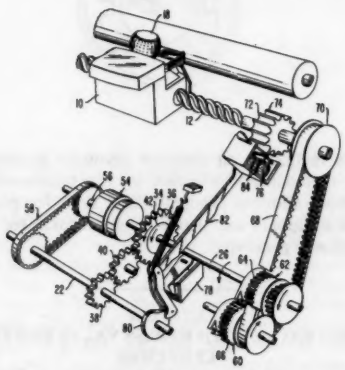
A character generator produces effects which are representative of the characters to be reproduced. It is coupled to restraining assemblies for the guides, whereby, simultaneously in one phase of each oscillatory cycle, selected wires will be projected for printing and the remaining wires will be prevented from printing.

3,715,021

VARIABLE DRIVE APPARATUS

Georg K. Caspari, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 27, 1970, Ser. No. 93,339
Int. Cl. B41j *19/00*
U.S. Cl. 197—82 **11 Claims**



Apparatus for imparting various rotational motions to a driven member in which a constantly rotating driving member transmits a predetermined angular velocity to the driven member by means of a frictional coupling. The angular velocity of the driven member is varied by overcoming the driving torque applied to the driven member by the frictional coupling. Means cooperating with the driving and driven members serve, respectively, to brake and to reverse the rotational motion of the driven member.

3,715,022

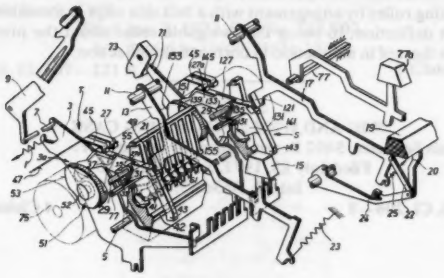
APPARATUS FOR POSTPONING AND STORING KEY CONTROLLED FUNCTIONS OF A TYPEWRITER

Albert Rix, Wilhelmshaven, Georg Werner, Heidmuehle, and Hans Fuchs, Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Continuation-in-part of application Ser. No. 40,514, May 26, 1970. This application Nov. 12, 1970, Ser. No. 88,767
Claims priority, application Germany, Nov. 15, 1969, P 19 57 471.1
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 **10 Claims**

The type action mechanisms and the function releasing mechanisms of a typewriter, for example the spacing device with the space bar, or the case shifting device, have control means cooperating with blocking means to permit only one mechanism to operate, while any other mechanism actuated during operation of a first actuated mechanism, is blocked in a storage position until the first operation is completed, whereupon the respective control means is moved by a spring to a position for starting the

operation of the second actuated mechanism. If the space bar is actuated before a previously actuated type action



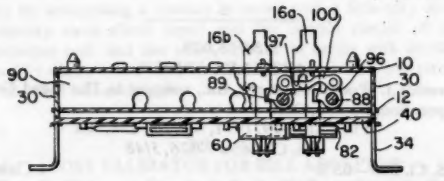
returns to its position of rest, the spacing function is stored, and takes place when the operation of the type action is completed.

3,715,023

CAM-AND-LINKAGE ARRANGEMENT FOR SIMULTANEOUS MOVEMENT OF MULTIPLE KEYSTEMS CONNECTED TO A COMMON KEY

Dean B. Jackson, Kettering, Edward S. Stork, Dayton, and Darrell L. Flory, Brookville, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 7, 1970, Ser. No. 62,037
Int. Cl. A01b *5/14*
U.S. Cl. 197—98 **1 Claim**



A modularly-constructed matrix-arranged keyboard having a printed circuit board and means associated therewith for opening and closing circuits for the purpose of relaying input information to a separate encoding system. The keyboard includes a plurality of keys with keystems, each stem capable of carrying a shunt member on its lower end for movement in a path between a switch and a magnet as the key is depressed and then released. A cam-and-linkage arrangement is provided for maintaining even distribution of the movement of multiple keystems connected to a common key.

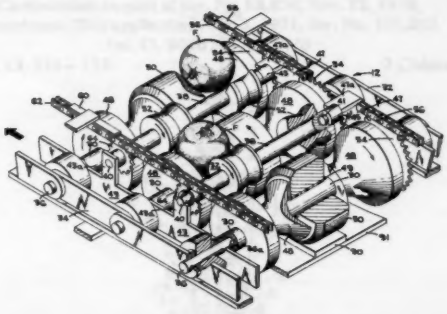
3,715,024

FRUIT ORIENTING APPARATUS

Harold J. Mumma, Riverside, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 23, 1971, Ser. No. 136,809
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **8 Claims**

An apparatus for orienting oblate spheroidally shaped fruit so that they roll upright on their major circumference includes pairs of parallel grommeted rollers having annular fruit contacting surfaces which cooperate to form fruit retaining pockets. Each roller of a pair of rollers rotates at a speed different from that of the other roller of the pair with the slowest rotating one of the two rollers contacting the fruit on two spaced circumferential bands and the faster moving one contacting the fruit on a circumferential band intermediate the two contact bands of the slower roller. Frictional contact between the rollers and a fruit retained thereby causes the fruit to shift around in the pocket until there is substantially no relative surface movement between the rollers and the fruit at the points of contact. When this state is attained, the fruit



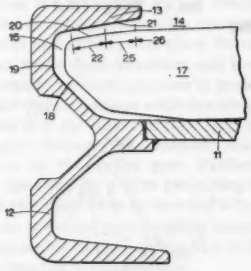
is rolling on its major circumference with the major circumferential area being in contact with the faster moving roller and with the smaller circumferences of the fruit, which are laterally displaced from the major circumference, being in contact with the slower moving roller. In such position, the stem-blossom axis of the fruit is substantially horizontal and perpendicular to the direction of movement of the rollers.

3,715,025

SCRAPER CHAIN CONVEYORS AND SCRAPER ELEMENTS

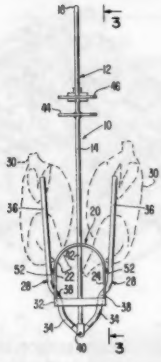
Helmut Temme, Waltrop, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Jan. 11, 1971, Ser. No. 105,570
Claims priority, application Germany, June 20, 1970, G 70 23 248.3; Great Britain, Dec. 15, 1970, 59485/70
Int. Cl. B65g *19/00*
U.S. Cl. 198—171 **1 Claim**



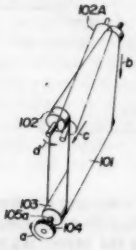
A scraper element for a scraper chain conveyor of the type having sigma-shaped side walls connected by a base wall and two chains moved along the center region of the base wall. The element is guided at its ends in guide channels defined by the inner parts of the side walls and including the inner faces of the upper flanges of the side walls. The upper surface of the scraper elements near each of its ends which is disposed facing one of the aforesaid inner faces is composed of a number of, preferably three, adjoining portions inclined at different angles to the base wall with the angle of inclination of said portions increasing outwardly of the element.

3,715,026
POULTRY SHACKLE
Onald R. Barnes, Oakdale, Calif., assignor to John Mohr & Sons, Milwaukee, Wis.
Filed Sept. 21, 1970, Ser. No. 73,993
Int. Cl. A22c *15/00;* **B65g** *17/20*
U.S. Cl. 198—177 **12 Claims**



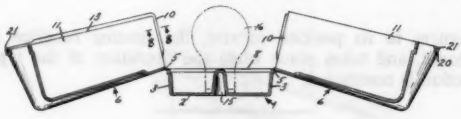
A shackle having a rod for extending and supporting an eviscerated bird in a position so that moisture can drip from the bird as the shackle is moved by an overhead conveyor. The shackle has means for pivoting the rod from a generally upright position at which it supports the bird to a downwardly extending position at which the bird can gravitate from the rod. The pivoting means can operate to return the rod to its upright position.

3,715,027
DEVICE FOR CORRECTING THE DEFLECTION OF A LARGE WIDE ENDLESS BELT
Sakae Fujimoto, Chofu-shi, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Dec. 8, 1970, Ser. No. 96,078
Claims priority, application Japan, Dec. 17, 1969, 44/102021; March 31, 1970, 45/27213
Int. Cl. B65g *15/62*
U.S. Cl. 198—184 **10 Claims**



An endless belt is trained over at least a pair of rollers, including at least one driven roller, and one of the other rollers is mounted for swinging about a pivot axis perpendicular to its axis of rotation. A pair of belt deflection detecting rollers are rotatably mounted adjacent respective opposite side edges of the belt and are spaced apart a distance slightly greater than the width of the belt so as normally to be out of engagement with the adjacent belt side edge. The detecting rollers are operatably connected to the mounting means for the swingable roller and are operable, responsive to rotation of the detecting roller by engagement with a belt side edge as a result of belt deflection, to swing the swingable roller about the pivot axis thereof in a direction to correct belt deflection.

3,715,028
WIG AND WIGLET CARRYING CASE
Louis Schumer, 5402 Beverly Road, Brooklyn, N.Y.
Filed July 13, 1971, Ser. No. 162,051
Int. Cl. B65d *85/18*
U.S. Cl. 206—8 **4 Claims**



The disclosure describes a plastic carrying case for wigs and wiglets molded in a single mold in its entirety into a hinged device comprising a base container upon which two integrally hinged open-faced hollow covers fold into each other and interlock with the walls of the base to form a closed carrying case. The closure means and the handle or carrying means are molded integral therewith. Similarly the rigid standard for supporting a removable wig block is also molded integral therewith.

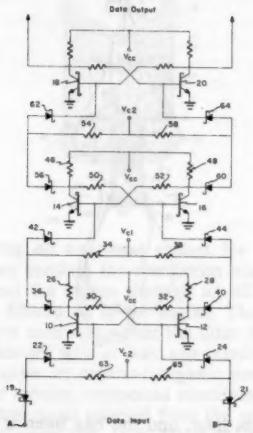
3,715,029
ARTICLE CARRIER
Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed April 29, 1971, Ser. No. 138,564
Int. Cl. B65d *77/26, 5/48*
U.S. Cl. 206—65 E **4 Claims**

An article carrier for primary packages having outwardly bowed sides of barrel-like configuration includes spaced top, bottom and side walls interconnected to form a tubular structure adapted for disposition about the primary packages arranged in rows in rectilinear relationship. An insert is provided with a pair of article separating elements interconnected with each other and disposed transversely within the carrier between pairs of adjacent primary packages disposed in different rows. The insert is configured so as to be formable from a minimum of material and is configured so that adequate article separation is afforded between adjacent articles in the same row of articles irrespective of the angular disposition of the insert with respect to a transverse axis of the carrier.

3,715,030
INTEGRATABLE HIGH SPEED REVERSIBLE SHIFT REGISTER

David R. Breuer, Malibu, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 3, 1972, Ser. No. 214,902
Int. Cl. G11c *19/00*; H03k *23/08*
U.S. Cl. 307—221 R 8 Claims

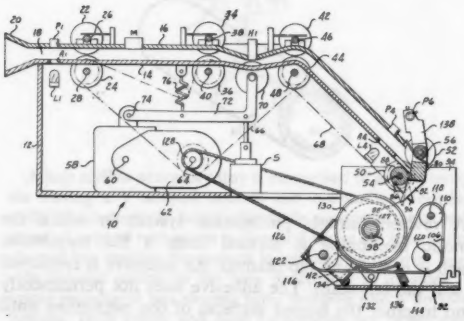


In a shift register composed of a multiplicity of transistor flip-flops, information is clocked from one flip flop to the next one by interposing a resistor in series with a Schottky diode Schottky each clock input and the output circuit of one transistor pair and the same resistor in series with another Scottky diode between each clock input and the input circuit of the next transistor pair.

3,715,031
POST VALIDATOR FOR BILL ACCEPTOR

Oliver G. Okkonen, Comstock Park, Mich., assignor to Rowe International, Inc., Whippany, N.J.

Filed April 14, 1971, Ser. No. 133,847
Int. Cl. B07c *3/16*
U.S. Cl. 209—75 17 Claims

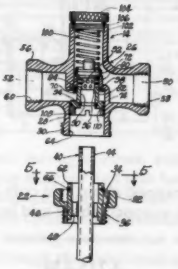


A post validator arrangement for a bill acceptor of a type known in the prior art utilizing a combination of photoelectric and magnetic checks of an item of currency passing therethrough in which the item is required to pass a secondary magnetic test at a location beyond an improved one-way mechanical gate positioned at the outlet of the bill acceptor.

3,715,032
FLUID TREATMENT DEVICES

Stanley Nicko, 905 Pontiac Avenue, Lafayette, Ind.

Continuation-in-part of Ser. No. 88,874, Nov. 12, 1970, abandoned. This application Nov. 3, 1971, Ser. No. 195,202
Int. Cl. B01d *35/02*, *27/10*
U.S. Cl. 210—133 2 Claims



Fluid treatment devices are disclosed utilizing a removable and preferably disposable fluid treatment unit, which may take the form of a filter, strainer, water softener or the like. The fluid treatment unit is removably mounted on a valve body which is arranged to direct the fluid through the treatment unit when it is mounted on the body. Inlet and outlet ports are preferably formed in the valve body and are adapted to be connected to the fluid supply system. The valve body is also preferably provided with discharge and return ports adapted to be connected to the fluid treatment unit. An automatic valve mechanism is provided in the valve body to disconnect the discharge port from the inlet port when the treatment unit is removed from the body. The outlet port is also preferably disconnected from the return port. In this way, no substantial quantity of the fluid will be discharged from the valve body when the treatment unit is removed. The automatic valve mechanism also preferably opens a bypass passage between the inlet and outlet ports when the treatment unit is removed. When a new fluid treatment unit is mounted on the body, the automatic valve mechanism is preferably operated so as to close the bypass passage while opening the normal service passages so that the fluid can flow from the inlet port to the discharge port, through the treatment unit, and then from the return port to the outlet port. Preferably, the valve mechanism is operated by a tube projecting out of the fluid treatment unit and adapted to be inserted into the valve body. The tube may be provided by a coupling component, adapted to receive a disposable canister or the like and arranged to be removably mounted on the valve body.

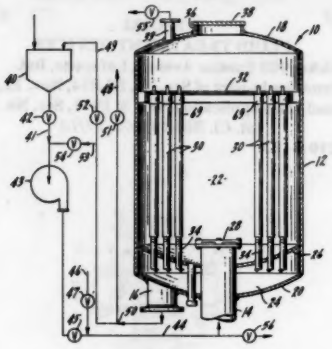
3,715,033
FILTER CARTRIDGE

Alfonse J. Soriente, Gillette, N.J., assignor to Ecodyne Corporation

Filed Nov. 9, 1970, Ser. No. 87,698
Int. Cl. B01d *29/08*
U.S. Cl. 210—193 4 Claims

A precoat filter cartridge for removing impurites from a liquid, comprising: a rigid tubular core element having holes

therein, said holes having a total area in the range of 3 to 9 percent of the total surface area of said core element; a layer



of course screen wrapped about said core element; and a layer of fine mesh screen wrapped about said layer of course screen.

3,715,034

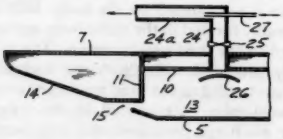
DEVICE FOR REMOVING OIL SLICKS

Alexander Ivanoff, 20 Brookside Drive, Greenwich, Conn.

Filed May 6, 1970, Ser. No. 35,154

Int. Cl. C02b *9/02*

U.S. Cl. 210—242 **12 Claims**



Oil floating on a body of water is collected by moving a shallow-draft water craft, such as a barge, having a sternwardly slanted bow section and below the water line an ingress opening in or near the bow section through an oil slick. The slant of the bow section forces oil in its path downwardly thereby causing the oil, possibly intermingled with water, to flow as a flat layer along the bottom of the barge. As the oil reaches the ingress opening it is propelled into a hold of the barge due to the pressure differential between the outside and the inside of the barge. Oil thus accumulating in a hold of the barge may be removed therefrom from time to time and clear water as may also enter the hold is returned to the body of water.

3,715,035

HIGH CAPACITY PORTABLE WATER PURIFIER

Gifford H. Teeple, Jr., 720 26th St., Manhattan Beach, Calif. 90266, and James W. Welsh, 776 North First East, Logan, Utah 84321

Filed Apr. 12, 1971, Ser. No. 133,252

Int. Cl. B01d *29/08*

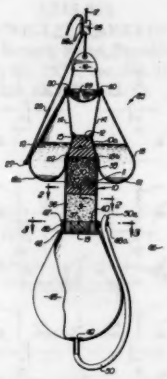
U.S. Cl. 210—249 **16 Claims**

A high capacity, portable water purifier comprises:

(a) Lower container means having an upper inlet and a lower outlet, said container means adapted to contain particulate media for treating liquid,

(b) Support structure for said lower container means, and

(c) Upper container means including a flexible bag adapted to receive and hold liquid to be purified, the upper container means suspended by said support means so that said bag extends below the level of said lower



container means inlet, and the bag interior communicating with said inlet so that liquid in the bag may be caused to flow to said inlet in response to elevation of the upper container means relative to the lower container means.

3,715,036

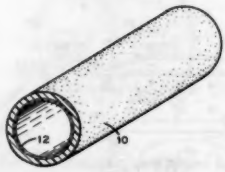
TUBULAR OSMOTIC MEMBRANE

Edward A. G. Hamer, 7 Elm Court, Metuchen, N.J.

Continuation of applications Ser. No. 508,052, Nov. 16, 1965, and Ser. No. 1,982, Jan. 12, 1970, both now abandoned. This application July 15, 1971, Ser. No. 165,791

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **24 Claims**



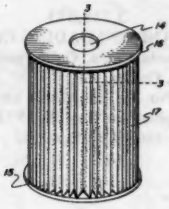
A reverse osmosis purification system in which the osmotic membrane is formed from a flat membrane which is curled and lap seamed. An adhesive is employed to seal the lap seam. The adhesive does not permanently bond together the lapped surfaces of the membrane until after the membrane is positioned in contact with the support tube and fluid pressure is applied to force the membrane into firm and conforming contact with the support member.

3,715,037

NOVEL LUBRICATING OIL SYSTEM AND OIL FILTER FOR INTERNAL COMBUSTION ENGINES

Shih-en Hu, Westfield, and Jerome Geyer, Elizabeth, N.J., assignors to Esso Research and Engineering Company

Filed Dec. 16, 1968, Ser. No. 784,221
Int. Cl. B01d 39/00
U.S. Cl. 210—501 7 Claims



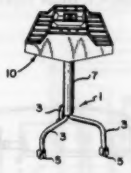
A lubricating oil treatment system for internal combustion engines involves the circulation and recirculation of the oil from the engine through an oil filter and the return of the filtered oil to the engine. The novel system contains a filter cartridge within the filter chamber which cartridge is charged with at least one relatively oil-insoluble solid inorganic or organo-inorganic simple or binary, or complex or ternary, compound containing a chemically bound transition metal selected from the group consisting of metals of Groups I–B, II–B, III–B, IV–B, V–B, VI–B, VII–B and VIII of the Periodic Table of the Elements. The passage of the circulating oil in the system may be, optionally, through a chamber in the system which is ahead of or after the oil filter, which chamber contains the solid particles of such a compound or mixture of compounds retained within the chamber and in place of or in addition to such compounds being placed within the oil filter.

3,715,038

HAIR STYLISTS ACCESSORY TRAY OF THE LIKE

Frederic V. Winkler, 14713 Waterway Drive, Rockville, Md.

Filed Sept. 21, 1971, Ser. No. 182,348
Int. Cl. A47f 3/14; B65d 1/24
U.S. Cl. 211—128 6 Claims



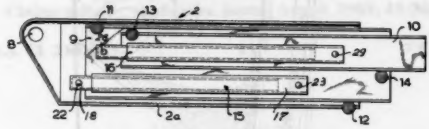
A hair stylists accessory tray is comprised of a base receptacle having a V shaped bottom and upstanding peripherial walls, the receptacle being adjustably supported on a mobile stand. A second receptacle is disposed above the base receptacle and has smaller dimensions length and width wise to provide manual access to the base receptacle at its sides. The upper receptacle has sloping sides merging into a horizontal bottom. Both upper and base receptacles are positioned in such fashion as to hold specific sizes of curling rollers, hair pins, clamps, etc., used in hairdressing in an orderly fashion readily accessable to an operator. Preferably the unit is formed of one piece of plastic or similar material by molding.

3,715,039

TELESCOPIC BOOM

Wolfgang Kollmann, and Dieter Schwappach, both of Dortmund-Wellinghofen, Germany, assignors to Orenstein & Koppel Aktiengesellschaft, Berlin, Germany

Filed Dec. 15, 1970, Ser. No. 98,228
Claims priority, application Germany, Dec. 16, 1969, P 19 62 945.9
Int. Cl. B66c 23/06
U.S. Cl. 212—55 4 Claims



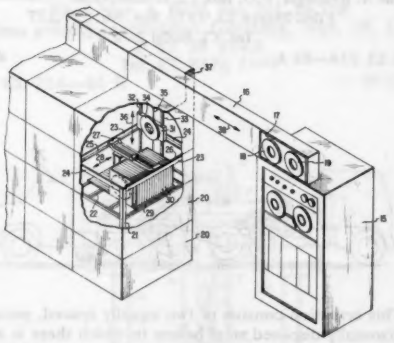
A composite boom having a boom section pivotally connected to a supporting member and also having a boom means telescopically movable into and out of said boom section while hydraulically operable cylinder-piston means arranged in telescopically movable housing elements are operable to actuate said boom means through the intervention of at least one of said housing elements, said hydraulically operable cylinder-piston means including serially arranged cylinder and pistons.

3,715,040

DATA ACCESSING SYSTEM

Anthony P. Polus, Ilion, and Russell H. Scheel, Liverpool, both of N.Y., assignors to Advanced Digital Systems Inc., Mohawk, N.Y.

Filed July 14, 1970, Ser. No. 54,827
Int. Cl. B65g 1/06
U.S. Cl. 214—16.4 R 10 Claims



A tape reel retrieval system having a plurality of bins or frames which can be stacked in groups depending on the size of the tape library. Each bin includes a plurality of reels, each in its own storage box, each box having an open side and interior gripping fingers. The frame carries a bridge which is movable along the reels until it reaches a selected one which it then extracts from the side-by-side reel arrangement. The reel is removed from the box, the box is returned to its storage location, and the reel is carried to the end of the bin by a gripping and transfer device on the bridge. The reel is then transferred to a conveyor which takes the reel to a point of use adjacent a tape transport.

3,715,041

REGULATOR FOR FEEDING MATERIAL TO A PROCESSING MACHINE

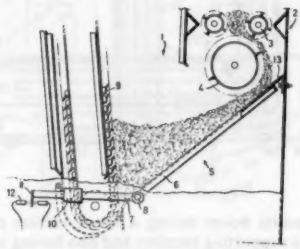
Franz Peters, Dulmen, Germany, assignor to Hergeth KG. Maschinenfabrik und Apparatebau, Dulmen, Germany

Filed July 8, 1970, Ser. No. 53,122

Claims priority, application Germany, July 11, 1969, P 19 35 184.9

Int. Cl. B65g *67/56*

U.S. Cl. 214—17 CA **7 Claims**



A device having a pivotally mounted load sensing means and a motor actuating means responsive to movement of the load sensing means is provided. The device regulates the feeding of material to a processing machine. The motor actuating means is for switching on and off a flow of material to be fed to the processing machine. The load sensing means is responsive to the weight of material flowing into a supply container for subsequent feeding to the processing machine. The load sensing means is adapted to move about its pivotal axis when material in the supply container reaches a predetermined level. A specific embodiment of this regulating device includes a mechanism for feeding spinning material or the like to a processing machine such as a carding machine, carders or the like.

3,715,042

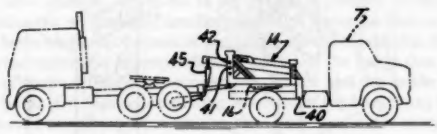
TRUCK RETRIEVER HOIST

Oscar A. Rellinger, P.O. Box 12, Helena, Ohio

Filed March 23, 1971, Ser. No. 127,227

Int. Cl. B60p *3/12*

U.S. Cl. 214—86 A **4 Claims**



This invention consists of two equally spaced, parallel and horizontally disposed steel beams to which there is attached by welding a ½ inch × 32 inches diameter plate and a standard SAE kingpin, such as all standard semi-trailers are equipped with. This kingpin engages in and is held firmly to any fifth wheel that is equipped with standard fifth wheel locking device. Two equally spaced, parallel and vertically disposed steel beams extend upward from the rear end of the aforesaid horizontally disposed steel beams. The purpose of the just-mentioned beams is to act as both a guide and partial support for the steel boom whose rear end is provided with a chain for the lifting of a disabled truck or the like. The aforesaid steel boom has its front end swingably supported by steel structure extending upward from the front end of the first-mentioned steel beams of this invention. A hydraulic cylinder, located on top of the steel boom, raises and lowers the boom. A second steel boom is swingably secured at one end to the underside of the rear end of this invention. This boom is provided with a laterally disposed steel beam for the stabilizing of one end of the disabled truck once it has been lifted by the first-mentioned steel boom. The previously mentioned hydraulic cylinder receives its power from the hydraulic system of the towing tractor or the like on which this invention is mounted.

3,715,043

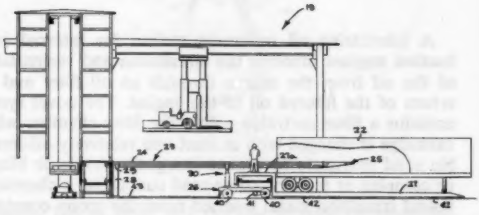
LOADING AND UNLOADING CONVEYOR

Stanley M. Weir, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 20,711, March 18, 1970, Pat. No. 3,613,910. This application May 28, 1971, Ser. No. 147,921

Int. Cl. B65g *67/02*

U.S. Cl. 214—38 B **9 Claims**



A loading-unloading conveyor boom is vertically adjustable with a ramp pivotally attached at one end that can be independently tilted up or down. The ramp has a set of movable wedge-shaped finger members for moving freight from its wedge-shaped finger tips to the conveyor boom or vice-versa. All motions of the loading-unloading conveyor boom are controlled by an operator working in the vicinity of the ramp. The loading-unloading boom is of fixed length, and is pivoted by a motorized cart that also moves an air-bearing supported platform on which a freight carrier or container rests, backward or forward and sideways left or right.

3,715,044

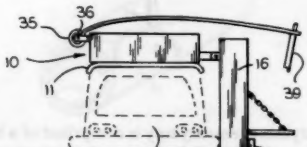
ROOF MOUNTED CARRIED FOR AUTOMOTIVE VEHICLES

Gary A. Simons, 2980 S. 149th St., New Berlin, Wis.

Filed Oct. 7, 1970, Ser. No. 78,833

Int. Cl. B60r *9/00*

U.S. Cl. 214—450 **5 Claims**



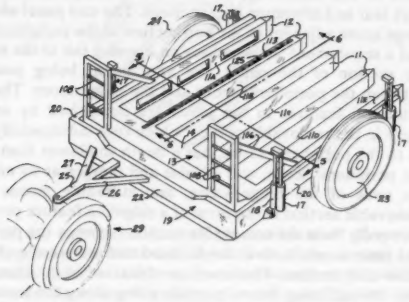
A rooftop carrier for an automotive vehicle includes a tray which slides out in a horizontal position and then swings down into a vertical position over the side of the auto. A front panel on the tray swings down to provide a table or counter for receiving a camp stove or forming a picnic table. Other compartments in the carrier receive suitable camp gear such as sleeping bags, cots and lamps.

3,715,045

APPARATUS FOR HANDLING BALED HAY

John B. Shawcroft, Route 2, P.O. Box 290, Alamosa, Colo.

Continuation of Ser. No. 10,573, Feb. 11, 1970, abandoned.
This application Dec. 20, 1971, Ser. No. 209,936
Int. Cl. B66f 9/18
U.S. Cl. 214—655 10 Claims



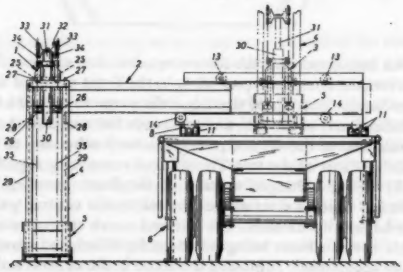
A bale handling machine for gathering baled hay or straw from a field, has spaced bars or tines mounted in a lifting frame and adapted to gather bales between them. The tines have projectable bale holders to grip and support a bottom layer of bales in spaced rows. The bottom bale layer serves as a floor or pallet for upper layers of bales. The tines can be projected between spaced rows of bales in the bottom of a stack to lift and remove a whole section from a stack. The machine can be pushed or pulled by a tractor and can be combined with a baler.

3,715,046

CARRIAGE WITH VERTICALLY AND HORIZONTALLY SHIFTABLE MAST AND CARRIER

Karl Georg Erland Marklund, Skelleftea, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed March 10, 1971, Ser. No. 122,814
Claims priority, application Sweden, March 11, 1960, 3207/70
Int. Cl. B66f 9/10
U.S. Cl. 214—674 5 Claims



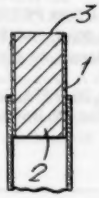
A loading apparatus for handling preferably loads supported on pallets. By means of this apparatus it is possible to lift loads positioned at floor or ground level at either side of for instance a truck, up to the loading platform of said truck and to then deposit said loads in any position on the platform, if desired in a stacked pattern. For this purpose the loading apparatus comprises a carriage movable in the longitudinal direction of the truck platform, a mast movable in the vertical direction relatively said carriage and supporting the lifting tool proper, such as a lifting fork, and a projection arm. The projection arm is arranged for movement in its longitudinal direction perpendicularly to the direction of movement of the carriage and horizontally relatively the carriage frame, and it supports the mast which is arranged for vertical displacement thereon. The mast may be arranged to move in a trolley in the vertical direction and the trolley moves in the horizontal direction of the projection arm. This arrangement provides for loading and unloading in an easy and quick manner and on a minimum of space.

3,715,047

SILICONE STOPPER FOR A STERILE CONTAINER

Ryoichi Sado, Oomiya, Japan, assignor to Shinetsu Chemical Company, Tokyo, Japan

Filed July 28, 1970, Ser. No. 58,814
Claims priority, application Japan, Aug. 4, 1969, 45/30557
Int. Cl. B65d 39/00
U.S. Cl. 215—47 7 Claims



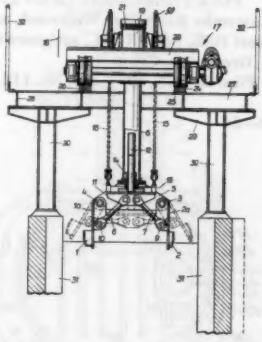
An otherwise closed sterile container is closed by inserting into the mouth thereof a removable plug. The plug is of silicone rubber having an open cell cellular structure. Sterility of the container is maintained. Moisture evaporation therefrom is reduced.

3,715,048

COMBINED GRIPPING AND LIFTING MECHANISM FOR HANDLING ANODE PLATES IN AN ANODE PLATE CASTING PLANT

Stefan Raab, Essen, Germany, assignor to Demag A.G., Duisburg, Germany

Filed Nov. 4, 1970, Ser. No. 86,798
Claims priority, application Germany, Nov. 19, 1969, P 19 58 074.6
Int. Cl. B65g 1/04
U.S. Cl. 214—16 B 9 Claims



A combined lifting and gripping mechanism for use in an anode plate casting plant includes a vertically movable column which may be driven upwardly and downwardly

for effecting the lifting of the anode plates in conjunction with a traverse carrying a pair of pivotally supported engagement members or grippers which have moved inwardly into gripping engagement during the initial stages of lifting, is carried on a lower end of a guide pin which is telescopic within the column. The traverse is moved vertically relative to the column by means of separate lifting elements such as lifting chains and these chains are moved upwardly and downwardly for the purpose of effecting a closing gripping movement of the grippers, or an outward releasing movement thereof for the engagement or disengagement of the associated anode plates.

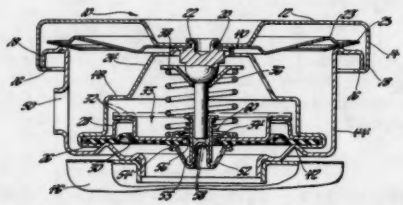
ERRATUM

For Class 215—47 see:
Patent No. 3,715,047

3,715,049
RADIATOR PRESSURE CAP

Wesley W. McMullen, Flint, and Tom B. Miller, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1971, Ser. No. 190,740
Int. Cl. B65d *51/16*
U.S. Cl. 220—44 R **3 Claims**

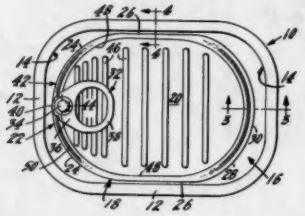


This invention relates to a closure cap and more particularly to a radiator closure cap. The cap is to be used on automobile type radiators and provides for the automatic relief or release of pressure and vacuum in the radiator. Pressure and vacuum relief is accomplished at the center of the cap, through a common opening.

3,715,050
FULL PANEL EASY OPEN END

Raymond Luscombe Batchelar, Westwood, and Carl William Heinle, Short Hills, both of N.J., assignors to American Can Company, Greenwich, Conn.

Filed Feb. 25, 1971, Ser. No. 118,807
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 **6 Claims**

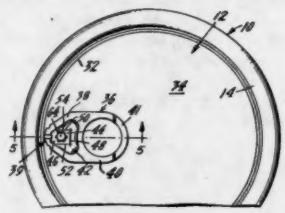


In a full open end closure for a container having a peripheral score defining a removable section in the panel of the end closure, a novel combination of structural features is provided to stiffen the portion of the panel encompassing the peripheral score. The peripheral score is comprised by a pop section at the forward end of the removable section which merges into adjoining start tear sections of the peripheral score, a detach section at the rearward end of the removable section which merges into adjoining minimum tear sections of the peripheral score, and full diameter tear sections at the sides of the removable section which merge into adjoining start tear and minimum tear sections. The end panel also has a hinge score adjacent to the pop section of the peripheral score and a securement for attaching an opening tab to the removable section of the panel, the attachment being positioned between the peripheral score and the hinge score. The novel structural features in the panel are comprised by an inner score in the removable section which runs substantially parallel to the peripheral score, has a depth shallower than that of the peripheral score, and adjoins and merges at its ends into the ends of the hinge score, and stiffening means in the removable section in the form of a ridgelike feature projecting outwardly from the removable section between the peripheral and inner scores both at the forward and rearward ends of the removable section. The novel combination of the inner score with the stiffening means provide a line along the inner score about which the central portion of the removable section is allowed to flex when subjected to forces directed against the removable section to thereby reduce the susceptibility of the peripheral score to abuse and premature fracture which would occur if the removable section should flex on a line along the peripheral score.

3,715,051
EASY OPENING CONTAINER

Edward Herman Hanke, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 30, 1971, Ser. No. 203,327
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 **2 Claims**



An improved pull tab for a container end closure. The improvement comprises providing in the front panel of the front non-handle portion of the tab a slit perpendicular to the longitudinal axis of the tab, and two score lines adjoining and perpendicular to the slit and parallel to each other and to the longitudinal axis of the tab. The slit and score lines together partially define a hinged section of the front panel of the tab through which a rivet affixes the tab to the central wall of the container end closure. The slit and score configuration protects the tab from being accidentally lifted and pivoted and from accidentally rupturing the score in the central wall.

3,715,052
FULL PANEL SELF-OPENING END CLOSURE

Christian Frederick Kinkel, Arlington Hgts., Ill., and Thomas Lawrence Phalin, Cary, Ill., assignors to American Can Company, Greenwich, Conn.

Filed Nov. 8, 1971, Ser. No. 196,670
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **6 Claims**

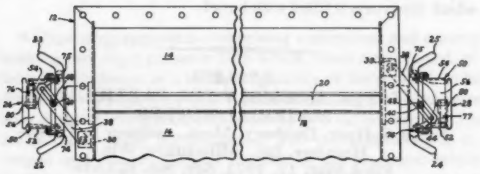
A self-opening end closure made of a steel basis sheet metal has both a rupturable score and a shallower non-rupturable

score formed in the interior surface of a generally flat central end panel of the end closure. The rupturable score is formed near the periphery of the central panel to define a large removable portion within the central panel, and the non-rupturable score is disposed closely adjacent to but radially inwardly of the rupturable score. This combination of scores and their placement in the interior surface of the central end panel make possible the commercial manufacture, within realistic manufacturing tolerance, of a self-opening steel end closure having acceptable score integrity and openability characteristics.

3,715,053
CAP LOCKING DEVICE FOR PNEUMATIC HOPPER OUTLETS

John H. Carter, Webster Groves, Mo., assignor to ACF Industries Incorporated, New York, N.Y.

Filed Sept. 10, 1971, Ser. No. 179,448
Int. Cl. B65d *45/00*
U.S. Cl. 220—55 R **6 Claims**



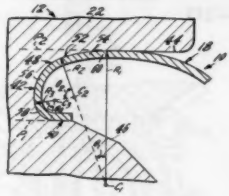
Mechanism for locking an end cap on each end of the rotary lading discharge tube of a pneumatic hopper outlet of a railway car includes a bail pivoted to the end cap on a transverse axis, and having arms extending inwardly from the pivots and provided with catches for engaging lugs fixed to the rotary tube. The outermost portion of the pivoted bail has a transversely extending lever mounted thereon provided with camming lugs adapted to bear against the top of the end cap. When the camming lever is turned down, the bail is held tightly against the end cap with the catches at the other end thereof forcefully pressed against the lugs on the rotary tube. Thus the end cap is securely latched to the rotary tube. Simply raising the camming lever permits the bail to be unlatched to ready the end cap for removal.

3,715,054
CAN END CLOSURE CURL

Erik Gedde, Park Ridge, Ill., assignor to American Can Company, Greenwich, Conn.

Filed June 11, 1971, Ser. No. 152,066
Int. Cl. B65d *7/42*
U.S. Cl. 220—67 **6 Claims**

A continuous curl formed on the periphery of a can end component prior to the first and second operations of double seaming the can end component to an end of a can body has an inner annular portion of a configuration substantially that of a surface of revolution generated by three successive merging arcs including an inner arc struck by a first radius R_1, a middle arc struck by a second radius R_2, and an outer arc struck by a third radius R_3, where $R_1 > R_2 > R_3$, and an outer annular portion of a configuration substantially that of a generally planar surface which is parallel to a plane formed by the innermost marginal edge of the inner arc of the inner annular portion of the continuous curl. A curler tool for forming the continuous curl has a curl-forming groove which has a contour substantially the same as the configuration of the inner and outer annular portions of the continuous curl formed by the curler tool.



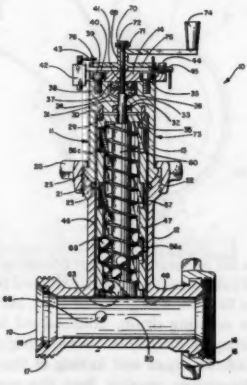
ERRATUM

For Class 220—39 see:
Patent No. 3,715,075

3,715,055
APPARATUS FOR INJECTING ONE OR MORE ARTICLES INDIVIDUALLY INTO A TUBULAR FLOW PATH

William D. Kendrick, Bruce J. Frazier, Norman L. Freeman, and Lyndel G. Ferguson, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed June 16, 1971, Ser. No. 153,537
Int. Cl. B65g *29/00*
U.S. Cl. 221—75 **10 Claims**



This invention relates to an apparatus for dispensing objects and more particularly to an apparatus with a grooved sleeve and a shaft having a helical rib thereon rotatably mounted in the sleeve, the objects being dispensed by the rib pushing them along the groove and out of the apparatus as the shaft is rotated.

3,715,056

HANDLING APPARATUS FOR ROD-LIKE ARTICLES

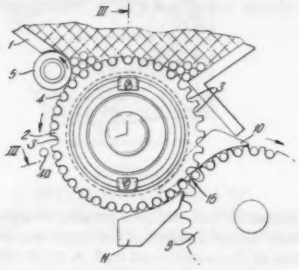
Edward George Preston, London, England, assignor to Molins Machine Company Limited, London, England

Filed Dec. 30, 1970, Ser. No. 102,753

Claims priority, application Great Britain, Dec. 31, 1969, 63451/69

Int. Cl. G01m 3/34

U.S. Cl. 221—211 3 Claims



A fluted drum forms the base of a hopper for multiple length rods of filter plug material and has suction applied to the flutes to assist in loading the flutes with the rods. The suction is maintained over part of the length of each flute outside the hopper so that only full length rods are retained.

3,715,057

APPARATUS FOR SEPARATING AND/OR COUNTING INDIVIDUAL ELEMENTS OF A PLURALITY

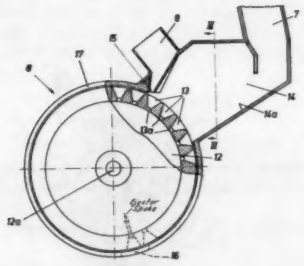
Reinhard Becker, Gieselwerder, Germany, assignor to Karl Becker KG Maschinenfabrik, Gieselwerder, Germany

Filed Dec. 9, 1971, Ser. No. 206,282

Claims priority, application Germany, Dec. 29, 1970, P 20 64 336.1

Int. Cl. A01c 7/04

U.S. Cl. 221—211 9 Claims



Apparatus for separating and/or counting individual ones of a plurality of substantially similarly shaped particles, elements, grains, or the like, such as grains of seed, pills, etc., and including a hollow rotating drum, constructed to have plural, inwardly tapering indentations, terminating in a bore open to the interior of the drum and having at the bottom of the indentation dimensions smaller than the particles so that the particles cannot traverse the bore, the indentations being wider than the particles at the surface of the drum, the indentation dimensioned to hold at least one particle each. A nozzle directs an air jet towards the drum at direction and position so that the air strikes along the leading wall portion of the closest indentation as the drum rotates. Particles are fed towards the drum, so that at least one particle is in each indentation as it passes the jet.

ERRATUM

For Class 222—241 see:
Patent No. 3,715,119

3,715,058

DOSING APPARATUS

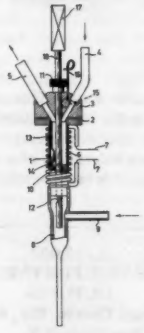
Augustien Maria Clymans, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed March 3, 1971, Ser. No. 120,664

Claims priority, application Netherlands, April 4, 1970, 7004874

Int. Cl. B67d 1/08

U.S. Cl. 222—148 9 Claims



A dosing device having a pin which is movable through a liquid chamber and comprises a recess which passes into the liquid and is filled after the forward stroke of the pin. The recess is emptied outside the chamber after a return stroke. Capable of cooperating with this pin is a spring-loaded member which is in the form of the recess and is capable of displacing a quantity of gas which may be in said recess after which the recess is filled with liquid.

3,715,059

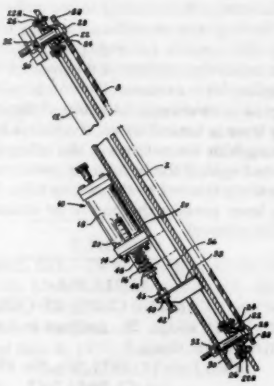
AGITATOR ASSEMBLY FOR PARTICULATE MATERIAL HOPPER

Frank S. Hyer, Duxbury, Mass., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 12, 1971, Ser. No. 123,616

Int. Cl. B65g 3/14

U.S. Cl. 222—199 13 Claims



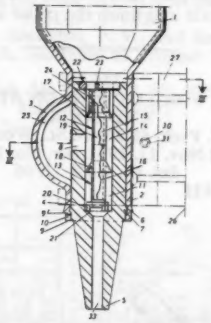
A gravity feed hopper has an agitator assembly comprising an internal screen and external vibrator rigidly

joined in spaced apart relation by bolts passing through openings in the hopper wall. The bases of resilient conical bushings are secured to the wall adjacent the openings to surround and connect with the respective bolts and resiliently support the agitator assembly on the hopper. Resilient upward bias is provided the agitator assembly by a compression spring coacting between the vibrator and an adjustable platform on the exterior of the hopper to compensate for the weight of the agitator assembly and the load imposed upon the screen by the material in the hopper.

3,715,060
DISPENSING APPARATUS

Gustav Eric Valdemar Benson, Malmo, Sweden, assignor to Perpedos AB, Malmo, Sweden

Filed July 30, 1970, Ser. No. 59,526
Claims priority, application Sweden, July 28, 1969, 10565/69
Int. Cl. B65d *37/00*
U.S. Cl. 222—207 **4 Claims**



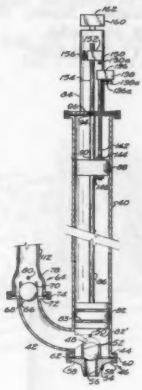
A dispensing apparatus comprising a container and a pump housing carrying a pressure bulb which, when compressed, effects the discharge of a metered quantity of the product to be dispensed through the positive pressure arising in the pressure bulb at this compression and whereby two valves, arranged in the pump housing are displaced. The pump housing is arranged in a narrow portion or neck of the container which neck has a swelling forming the pressure bulb. The container with its neck and pressure bulb are formed in one piece from non-rigid plastic or rubber materials.

3,715,061
DISPENSING PUMP ASSEMBLY FOR BAKERY MATERIALS

Richard L. Morine, Mentor, and James J. Hokes, Lakewood, both of Ohio, assignors to Fedco, Inc., Mentor, Ohio

Filed April 29, 1971, Ser. No. 138,475
Int. Cl. G01f *11/06*
U.S. Cl. 222—334 **4 Claims**

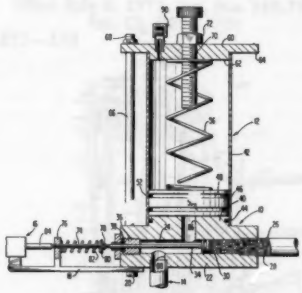
The specification and drawings disclose a dispensing pump assembly which includes a first, vertically extending tubular cylinder for a piston mounted therein and adapted to reciprocate vertically. At the lower end of the cylinder, there is an inlet provided with a check valve which permits flow in only one direction into the cylinder. Immediately above the check valve is a discharge outlet having an outlet check valve. Preferably, the inlet and outlet check valves are relatively large diameter balls. Extending upwardly from the discharge check valve is a discharge pipe or tube which connects to a horizontally extending dispensing control assembly. The dispensing control assembly includes a pipe having an outlet and a reciprocal slide valve which controls flow through the outlet. Both the piston and the slide valve are controlled by separate double acting air cylinders. Additionally, control means are provided for controlling the operation of the air cylinders so that the valve is opened only when the piston is moving toward the inlet valve.



3,715,062
METHOD AND APPARATUS FOR DISPENSING MATERIAL

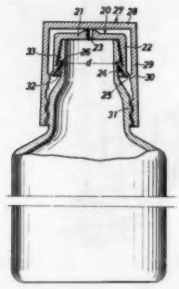
Donald L. Todd, 560 10th St. NW., and Cecil W. Scoggins, 1189 Holley St. NW., both of Atlanta, Ga. 30318

Continuation of abandoned application Ser. No. 799,157, Feb. 14, 1969. This application Aug. 16, 1971, Ser. No. 172,284
Int. Cl. G01f *11/36*
U.S. Cl. 222—340 **5 Claims**



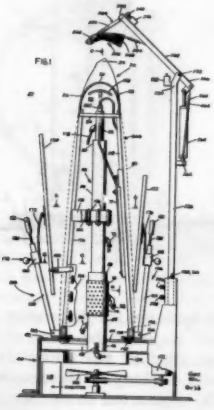
A method and aparatus for dispensing a slurry of material. The method includes the steps of accumulating a predetermined quantity of the slurry from a pressure source subsequently discharging the accumulated quantity of the slurry. The apparatus comprises a valve and accumulator assembly for receiving material such as a crushed ice slurry under pressure. In one position of the valve, the accumulator accepts a predetermined quantity of the material and when the valve is returned to its normal position, the accumulator expels the predetermined quantity of material through a dispensing nozzle.

3,715,063
CAP STRUCTURE HOLDING AN INNER CLOSURE
Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino, Chiba-ken; Shinichi Araki, Funabashi, and Shinzo Miyamoto, Soka, all of Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan
Filed March 11, 1971, Ser. No. 123,199
Claims priority, application Japan, March 18, 1970, 45/26067; March 19, 1970, 45/26654
Int. Cl. B67d *3/00*
U.S. Cl. 222—545 5 Claims



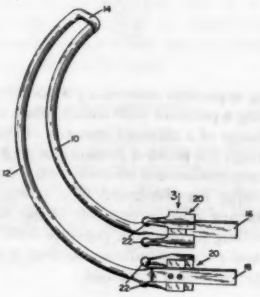
A cap structure holding an inner closure within an outer cap as one body, which is conveniently fixed to a container neck by means of a capping machine and leaves the inner closure on a container neck when the outer cap is removed from a container neck after the cap has been fixed on a container neck.

3,715,064
GARMENT FINISHING APPARATUS
William L. North, Morristown, and George S. Eubank, Newport, Tenn., assignors to Forenta, Limited, Kincardine, Ontario, Canada
Filed Feb. 10, 1971, Ser. No. 114,253
Int. Cl. D06c *5/00*
U.S. Cl. 223—57 32 Claims



A steam-air coat and dress finisher comprising an upstanding post having lower and upper ends, the lower end being supported on a base enclosure generally centrally of an opening in the top wall thereof. A buck is mounted on the upper end of the post and an inflatable bag is suspended therefrom surrounding the post and having an open lower end communicating with the opening in the top wall of the enclosure. The post has a cavity therein extending substantially between its ends and a chamber surrounds the post intermediate its ends in heat-transfer relationship therewith, the chamber including an exterior wall having passages therethrough communicating with the interior of the bag. A steam line is coupled to the post cavity and a conduit has one end communicating with the post cavity and its other end communicating with the chamber, the conduit having a valve therein for selectively admitting steam from the post cavity to the chamber for outward flow through the passages therein into the bag thereby to heat and moisten a garment which is suspended from the buck and which surrounds a portion of the bag. A blower in the enclosure forces air through the top wall opening and into the bag to inflate the bag and dry the garment thereon. In one embodiment, a generally U-shaped, relatively narrow band formed of relatively thin, flexible mesh material is provided selectively movable between an inactive position spaced from the buck and an active position with the band embracing the collar of the garment and its ends engaging the lapels thereby to restrain and finish the collar and lapels.

3,715,065
DEVICE FOR PUTTING ON STOCKINGS AND SOCKS
Edmond C. Peck, 50 Heard St., Worcester, Mass.
Filed Nov. 11, 1971, Ser. No. 197,712
Int. Cl. A47j *51/06*
U.S. Cl. 223—111 3 Claims

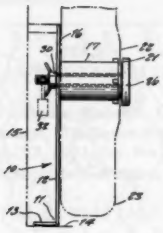


A tubular member in the form of an arc having two spaced longitudinal and curved members with an open end and a closed end, and at each free end at the open end there being a pair of components representing the first two fingers of the hands over which the stocking is applied prior to use.

3,715,066
HANDY TIRE RACK
Charles L. Owen, Route No. 4, P.O. Box 1025, Conroe, Tex.
Filed April 8, 1971, Ser. No. 132,354
Int. Cl. B62d *43/00*
U.S. Cl. 224—42.24 3 Claims

A device for supporting a tire and wheel upon a truck, the device composing a vertical bracket forming a stanchion, at the lower end of the bracket being fixedly mounted within a bed of a truck, the bracket having a sidewardly extending cylinder welded thereto with lugs welded there around and

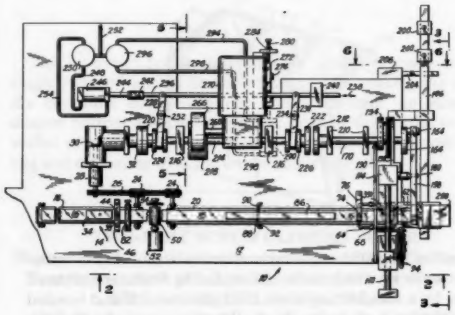
against which a wheel may be positioned while a removable bolt is inserted through the cylinder with the bolt head positioned against the outer side of the wheel, the end of the bolt then receiving a securing nut.



3,715,067
APPARATUS FOR MANUFACTURING SLIDE COVERS

Peter Hunsinger, Brooklyn, N.Y., and James C. White, Rutherford, N.J., assignors to Propper Manufacturing Company, Inc.

Filed Feb. 16, 1971, Ser. No. 115,211
Int. Cl. B26f *3/00*
U.S. Cl. 225—96.5 **4 Claims**

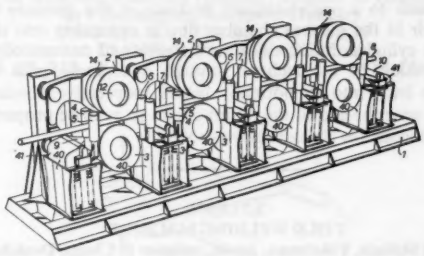


Slide covers and method and apparatus for manufacturing the same. The slide cover is made of a transparent material such as glass and has a smooth, polished surface. An elongated blank the length of which is several times that of the slide covers is fed by a suitable feeding structure through and beyond a cutting location until a leading end of the blank is situated at a distance beyond the cutting location equal to the required length of the slide cover. A control assembly then automatically terminates the feeding of the blank and a cutting structure cuts across the blank at the cutting location so that a slide cover of predetermined length is separated from the blanks, whereupon this cycle of operations is automatically repeated. The elongated blanks from which the slide cutters are derived are fed automatically one after the other through and beyond the cutting location where the above operations take place. As the slide covers are cut from the blanks they are collected at a collecting station where a predetermined number of the slide covers are collected. Upon reaching this predetermined number the operations are automatically terminated until the collected predetermined number of covers are removed from the collecting location, whereupon the above cycle of operations then automatically starts again.

3,715,068
APPARATUS FOR THE LAYING OR RECOVERY OF CABLES

Eric Fifield Stuart Clarke, Harrow; James Edwin Henry Cosier, Northolt; Jan Kolanowski, London; Peter Seaton Halls, St. Albans, and Alexander Duncan Lindley Laidlaw, Harrow, all of England, assignors to The Post Office, London, England

Filed Aug. 28, 1970, Ser. No. 67,941
Int. Cl. B65h *12/22*
U.S. Cl. 226—108 **13 Claims**

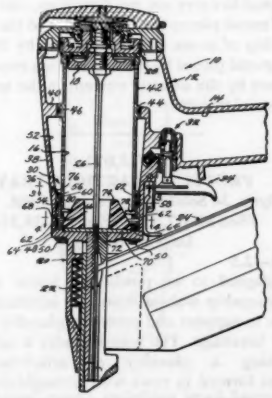


A cable engine for the laying or recovery of submarine cables includes hydraulically powered traction wheels fitted with pneumatic tires to apply traction to a cable. The traction wheels are arranged in pairs, each pair contacting the cable at opposite ends of a diameter, and are resiliently mounted to enable a repeater to pass through the engine without damage. Resiliently mounted guide rollers may be employed in addition to the traction wheels. A shipboard mounting for the engine is shown and includes a load cell arrangement to enable cable tension to be monitored. A hydraulic control system for use in both laying and recovering operations is described.

3,715,069
PNEUMATICALLY ACTUATED FASTENER DRIVING DEVICE WITH IMPROVED SLEEVE VALVE FOR CONTROLLING THE PRESSURE BENEATH THE DRIVE PISTON

Robert F. O'Connor, Greenville, R.I., assignor to Textron Inc., Providence, R.I.

Filed July 8, 1971, Ser. No. 160,794
Int. Cl. B25c *1/04*
U.S. Cl. 227—130 **6 Claims**



A pneumatically actuated fastener driving device having a conventional plenum chamber air return system

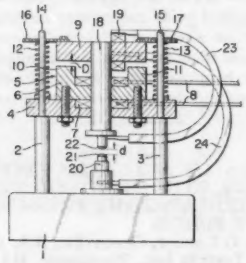
and a sleeve valve mechanism normally biased into an inoperative position permitting unrestricted exhaust flow of air outwardly of the lower end of the drive cylinder through enlarged exhaust ports during the drive stroke of the drive piston and fastener driving element, the sleeve valve mechanism being operable in response to the charging of the plenum chamber with return air at a predetermined pressure to move into an operative position closing off the unrestricted flow through the exhaust ports and communicating the return air with the drive cylinder to effect the return stroke of the drive piston and fastener driving element, the valve mechanism being operable in response to a predetermined decrease in the pressure of the air in the plenum chamber due to expansion into the drive cylinder during the return stroke and to controlled dissipation to atmosphere through a separate path to move back into its normally biased inoperative position at or near the end of the return stroke so as to be properly conditioned for the next drive stroke.

3,715,070

COLD WELDING MACHINE

Akira Shibata, Yokohama, Japan, assignor to Chugai Denkikogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1970, Ser. No. 94,026
Claims priority, application Japan, Dec. 12, 1969, 44/99972
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 **4 Claims**



A cold welding machine which includes a special transformer adapted to carry out two functions, one of which is the upsetting of metal pieces to be bonded, and the other of which is the releasing of stress or strain caused by the pressure applied to the metal pieces by the hammering member, the strain being released by the electric current in the secondary winding of the special transformer.

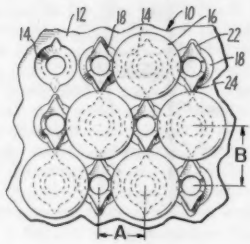
3,715,071

PROTECTIVE ARTICLE TRAY

Stanley F. Flynn, 34 Sotelo Way, Novato, Calif.

Filed May 7, 1970, Ser. No. 35,314
Int. Cl. B65d *1/36*
U.S. Cl. 229—2.5 **2 Claims**

A tray adapted to be positioned inside a container in stacked relationship with at least one additional tray of like construction to support and protect a plurality of fragile articles against breakage. The tray includes a substantially flat plate defining a plurality of article-seating spaced throughbores formed in rows with throughbores of adjacent rows being disposed in staggered relationship to each other. The tray further includes a plurality of spacer members projecting outwardly from at least one side of said flat plate and alternating with said throughbores in each row. Each of the spacer members is of substantially resilient construction and is of a size and configuration adapted to engage articles seated in adjacent throughbores in both the same row occupied by said



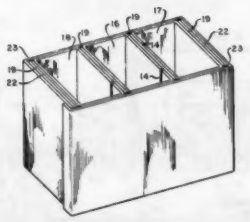
spacer member and rows adjacent to said same row to prevent the articles from contacting one another.

3,715,072

MULTIPLE-CELL BOX FOR FLOWABLE MATERIAL

Billy J. Muskopf, and Ronald W. Wiemann, both of Houston, Tex., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed March 5, 1971, Ser. No. 121,414
Int. Cl. B65d *5/48*
U.S. Cl. 229—15 **7 Claims**



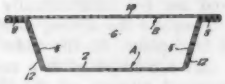
A box for flowable material comprises a plurality of independent cells in which coextensive facing walls are secured together by a reenforcing sheet coextensive with and bonded by adhesive to such walls. To facilitate registry of adhesive, both faces of the reenforcing sheet have adhesive applied thereto, and bonding of the sheet to the walls is then effected.

3,715,073

DECORATED OR PRINTED CONTAINERS

Gilbert Leslie Gibbs, Frampton Cotterell, Bristol, and Timothy Muir Davies, Clifton, Bristol 8, both of England, assignors to E S & A Robinson Limited, Bristol, England

Filed Feb. 18, 1971, Ser. No. 116,390
Claims priority, application Great Britain, Feb. 19, 1970, 8,125/70
Int. Cl. B65d
U.S. Cl. 229—43 **6 Claims**



A formed container body having a planar top with straight edges is decorated by applying a preprinted blank of sheet material to the top, around the edges and over the sides. Ap-

paratus for applying the blank has a pattern or cam the same shape as the external profile of the side portions of the container. A cam follower operates a pressure member which brings the sheet material into face-to-face contact with the side portions of the container.

3,715,074

STANDABLE BAG MADE FROM FLEXIBLE FILM MATERIAL

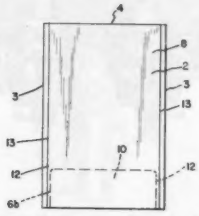
Wolfgang Michel, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Feb. 23, 1971, Ser. No. 118,106

Claims priority, application Germany, Feb. 25, 1970, P 20 08 780.3

Int. Cl. B65d *33/00*

U.S. Cl. 229—57 **17 Claims**



This invention relates to a bag-like container made from a single piece of flexible film and a process for making the same, the container comprising two lateral surfaces, an inwardly domed bottom adjacent the lower ends of said surfaces, and sealed seams between two layers of film laterally limiting the bag and extending over the entire bag length.

3,715,075

TWO-PART SCREW CLOSURE COVER

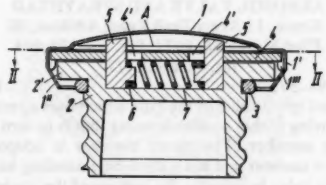
Werner Blau, 52, Gladbacherstrasse, and Theo Gerdes, 24, Lortzingweg, both of Langenfeld, Rhineland, Germany

Filed June 18, 1971, Ser. No. 154,409

Claims priority, application Germany, June 22, 1970, P 20 30 600.7

Int. Cl. B65d *41/04*

U.S. Cl. 220—39 R **5 Claims**



A two-part screw closure cover for containers or a pipe or tube socket, comprising coupling members in mutual engagement for connecting purposes and having a ratchet-like action, for automatic disengagement upon reaching a predetermined tightening torque of the cover, in which the coupling members are outwardly supported between both mutually freely rotatably mounted cover parts and are mounted in the inner circumference of one part of the cover, which coupling parts, which are provided with groove-like recesses, cooperate, in a radial direction, with a coupling means engaging with a ratchet-like action in the other part of the cover and, when a predetermined tightening torque for the screw cover part is reached, automatically disengage therefrom.

3,715,076

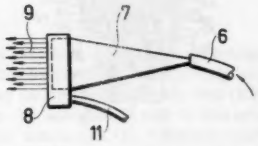
METHOD AND APPARATUS FOR SPRAYING POWDERED THERMOPLASTIC SUBSTANCES

Tibor Kenderi, Budapest, Hungary, assignor to Hajtomu es Felvonogyar, Budapest, Hungary

Filed Apr. 23, 1971, Ser. No. 136,936

Int. Cl. B05b *1/24, 1/28;* C23c *7/00*

U.S. Cl. 239—8 **14 Claims**



Powdered themoplastic substances are sprayed in heated form against a substrate, by entraining the powder cold in a gas stream, and ejecting the gas stream from a nozzle in the form of a flat cloud. The cloud is confined between a pair of further gas streams and is heated on the way to the substrate. Heating may be effected by passing the cloud sandwiched between its confining streams, between a pair of opposed electric heating elements. Alternatively, heating may be effected by heating the confining streams themselves, particularly if the confining streams are flames emerging from a burner.

3,715,077

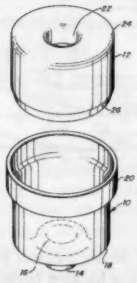
SHEET METAL TWO-PART SPRINKLER HEAD AND APPARATUS AND PROCESS FOR MAKING

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Worcester, Mass.

Filed Dec. 18, 1970, Ser. No. 99,595

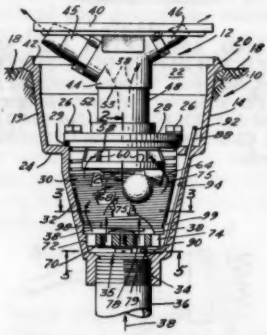
Int. Cl. B05b *1/02*

U.S. Cl. 239—200 **12 Claims**



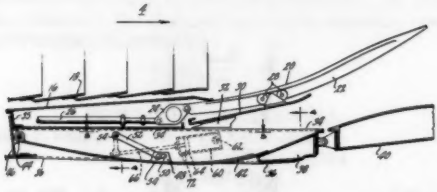
A two-part sheet metal sprinkler head housing is disclosed in which the metal grain is continuous and is in line with the contours of the parts and an apparatus and process for making it.

3,715,078
WATER SPRINKLER DEVICE
Elmer N. Reynolds, 15915 Arbela Dr., Whittier, Calif.
Filed July 22, 1971, Ser. No. 165,158
Int. Cl. B05b *3/04*
U.S. Cl. 239—206 10 Claims



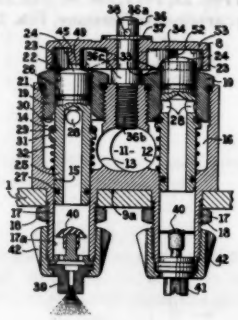
A water sprinkler device comprising a main body housing having a dual pop-up spray nozzle with a cover attached thereto for movement with the spray nozzle, the nozzle being axially aligned within the main body and movably supported in a bearing wall member which is secured intermediate the ends of the main body housing, the spray nozzle being provided with a striking base member for rotating the dual spray nozzles by means of a ball striking the base member. A helical spring is disposed within the base member and a second helical spring is also disposed and secured in the lower portion of the main housing. A valve disc is secured into the lower portion of the main body, said disc having annularly arranged slots and a pair of centrally positioned flow passages which are adjustable for regulating the amount of water passing therethrough by a valve member and a connecting valve-adjusting stem.

3,715,079
BLOW-IN-DOOR ACTUATION FOR AFTER BURNER NOZZLE
Charles L. Thompson, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed April 7, 1971, Ser. No. 131,971
Int. Cl. B63h *25/46*
U.S. Cl. 239—265.17 4 Claims



The blow-in-doors for an exhaust nozzle are held in open position by an air piston located between adjacent doors that permits the doors to close when a predetermined pressure differential is built up on the doors. A cable and pulley connection from the air piston to the doors permits the doors to move independently with an actuating pressure still maintained on the doors.

3,715,080
SPRAYING DEVICE FOR A LIQUID DISTRIBUTING SYSTEM FOR AGRICULTURAL USE
Claude Bastide, Colombes, France, assignor to Etablissements Roffo, Livry-Cargan, France
Filed Nov. 3, 1971, Ser. No. 195,211
Claims priority, application France, Nov. 23, 1970, 7041984, Sept. 27, 1971, 7134666
Int. Cl. A62c *31/00*
U.S. Cl. 239—444 16 Claims



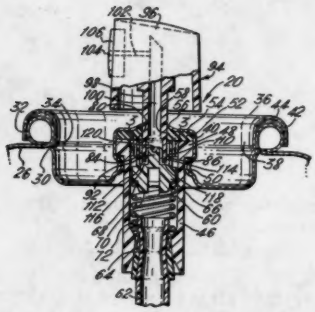
A spraying device for agricultural use having two spray nozzles and supplied with liquid under pressure such as a liquid fertilizer. The device has a liquid supply chamber which communicates with the two nozzles through two distributing chambers. The two nozzles give different sprays. A cam means acts on two valve members respectively movable in the two distributing chambers for causing, in a first position of the cam means, a first of the valve members to close off the corresponding distributing chamber from the supply and the second valve member to allow the supply of liquid into its corresponding distributing chamber and, in a second position of the cam means, the first valve member to allow the supply of the liquid into its corresponding distributing chamber and the second valve member to close off its corresponding distributing chamber from the supply. A third position of the cam means causes both valve members to allow the supply of the liquid to their distributing chambers.

The spraying device is adapted to be mounted on a liquid spraying distributor with a plurality of other such devices.

3,715,081
AEROSOL VALVE AND SPRAYHEAD
Edward H. Green, 11 Army Trail Road, Addison, Ill.
Filed March 26, 1971, Ser. No. 128,404
Int. Cl. B05b *1/30*
U.S. Cl. 239—573 13 Claims

An aerosol spray valve of the type which uses a reciprocable plunger moving within a valve housing that is in turn mounted to a cover member. The cover member is adapted to be crimped to a canister and has a dip tube extending from the interior or the valve housing to the bottom of the canister. Pressurized product is forced from the interior of the canister through the dip tube into the valve housing and out of the cover member through a central hole into a sprayhead that is mounted in the hole. An elastomeric gasket surrounds the hole and the upper end of the reciprocable plunger forms a valve seat that is spring-biased against the underside of the gasket to prevent pressurized product from emerging. The sprayhead has an associated stem that enters a socket formed

in the plunger, the stem being slidably and sealingly engaged through the hole and the passageway in the elastomeric gasket. The stem is imperforate and hollow and has an axial end opening at its bottom. The socket of the plunger has channel means formed in its interior wall along the vertical length thereof so that there are one or more passageways formed between the outer surface of the stem and the socket to transport the pressurized product down into the socket. The socket has a central upstanding post and the bottom end of the stem fits into the annular space between the post and the inner surface of the socket wall. The post has vertically extending channels formed therein and there are grooves in the floor of the socket to convey the pressurized product from the bottom end of the channel means formed in the wall to the channels formed in the post. In this case, the bottom end of the stem is engaged against the floor of the socket. In the alternative, means may be provided to space the bottom end of the stem above the floor so that there is no need for grooves in the floor. Metering is preferably controlled by the total cross section of the channels in the post.

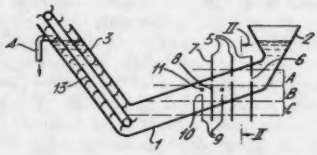


3,715,082

ELECTRO-HYDRAULIC CRUSHING APPARATUS

Kenneth Wallace Carley-Macauly, Didcot; James Witham Hitchon, and Robert James Moulton, both of Newbury, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 7, 1970, Ser. No. 95,561
Int. Cl. B02c *19/00*
U.S. Cl. 241—1 **11 Claims**



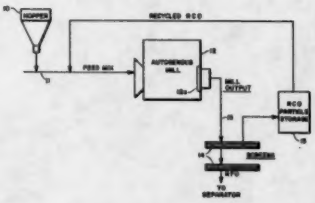
Coarse feed material in a liquid medium is allowed or introduced to stratify and the material in the coarse stratum is then subjected to shocks from a spark discharge. Preferably, also, the material in each successively finer stratum is subjected to further shocks by spark discharges at an energy and frequency optimized according to the particle size range in each stratum.

3,715,083

METHOD FOR CONTROLLING THE GRIND IN A SINGLE STAGE AUTOGENOUS GRINDING MILL

Robert M. Funk, Allentown, Pa., assignor to Bethlehem Steel Corporation

Filed Dec. 17, 1970, Ser. No. 99,182
Int. Cl. B02c *17/00*
U.S. Cl. 241—24 **1 Claim**



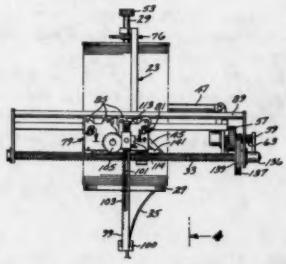
Crushed run-of-the-mine ore is fed to an autogenous mill in size ranges arbitrarily classified as relatively coarse (RCF), relatively medium (RMF) and relatively fine (RFF) particles. The output from the autogenous mill is also arbitrarily classified as relatively coarse (RCO), relatively medium (RMO) and relatively fine (RFO) particles. The particles in the output are smaller than the crushed run-of-the-mine ore fed to the mill. The relatively coarse particles (RCO) of the output are stored, and, intermittently, amounts thereof are returned to the mill as a portion of the feed thereto to maintain a ratio of the size consist in the mill at 35/40 percent relatively coarse:20/30 percent relatively medium:35/40 percent relatively fine particles. The relatively medium particles (RMO) can be recycled to the mill as a part of the feed. The relatively fine (RFO) particles in the output from the mill are passed to beneficiation. Maximum throughput of run-of-the-mine ore at constant power input to the mill is maintained.

3,715,084

QUICK DUMP HOIST

Joseph Weiss, Jr., 1010 Larch No. 6, Inglewood, Calif.

Continuation-in-part of Ser. No. 745,532, July 17, 1968, abandoned. This application March 5, 1970, Ser. No. 9,005
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 R **8 Claims**



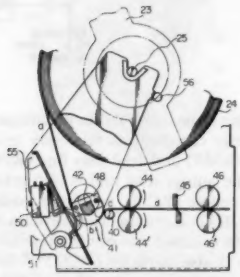
A quick dump hoist for rapidly lowering a cable from a helicopter and including a main frame secured to the helicopter and a pivotal frame mounted on the main frame and cantileverally carrying a rotatable drum. Means is provided for rotating the pivotal frame to selectively orient the drum in a horizontal, take-up position, wherein the drum may be rotated to wrap cable thereon and a vertical, feed-out position, wherein the cable will fall freely from the end thereof. A track is provided along one side of the drum and supports a threading means which includes an eye for feeding the cable uniformly on the drum as such means is fed along the track in accordance with rotation of the drum during cable take up.

3,715,085

DEVICE FOR SUPPLYING CONTINUOUS SHEET OF PAPER FROM A ROLLED PACKAGE USED IN A COPYING APPARATUS

Akira Kobayashi; Toshio Koike, and Keiichi Sato, all of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sept. 15, 1970, Ser. No. 72,258
Claims priority, application Japan, April 9, 1970, 45/33611; April 9, 1970, 45/33612; April 13, 1970, 45/34833
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 R **9 Claims**



An electrophotographic apparatus comprises supporting means for rotatably supporting a roll of paper, a mechanical system for advancing the paper through the apparatus, a roller rotatably mounted along the advancing path of the paper for eliminating the tendency of the paper to reroll; a cutting device for cutting the paper into separate sheets, and sensing means for sensing the consumption of the roll of paper. The supporting means comprises a rotatable shaft having a flange mounted on each end thereof for supporting therebetween the roll of paper. One end of the shaft is provided with a helical thread which cooperates with a pivotal lever on one flange to releasably and adjustably mount the flange on the shaft. A biasing spring urges the lever into engagement with the helical thread to releasably lock the flange on the shaft and the spring may be compressed by manually pivoting the lever against the spring force whereby the flange may be slid off of the shaft so that another roll of paper may be mounted thereon.

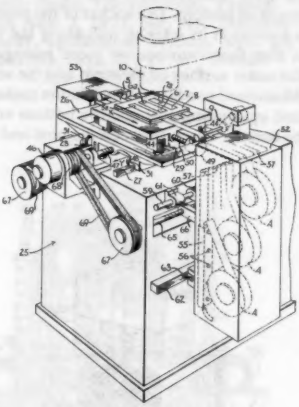
3,715,086

FILM MOVING MEANS IN MACHINE FOR READING BUBBLE CHAMBER PHOTOGRAPHS

Borje Angelstrand, and Ragnar Mostrom, both of Jonkoping, Sweden, assignors to Saab Aktiebolag, Linkoping, Sweden

Filed Aug. 28, 1969, Ser. No. 854,147
Claims priority, application Sweden, Aug. 28, 1968, 11532
Int. Cl. B65h *17/02*; **G01n** *21/30*
U.S. Cl. 242—67.3 **4 Claims**

A reading machine for bubble chamber photographs has a horizontal film table across which film is lengthwise advanced, frame by frame, from a supply reel at one side of the table to a takeup reel at the other side thereof, and to which the film is flatwise clamped for horizontal movement with the table. Carriers for the reels, extending below the table at opposite sides thereof, are mounted for motion transverse to film length and



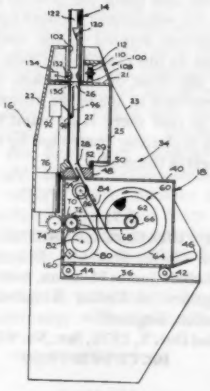
are driven in such motion in unison with the table to avoid twisting the film.

3,715,087

SHEET FILM STORAGE MAGAZINE

Gunter Schmidt, Malibu, Calif., assignor to Production, Inc., Los Angeles, Calif.

Filed Feb. 18, 1971, Ser. No. 116,550
Int. Cl. G03b *17/30*
U.S. Cl. 242—67.3 R **10 Claims**



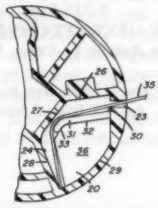
Apparatus particularly useful for facilitating the handling of X-ray film sheets in daylight. The apparatus includes an X-ray film sheet cassette adapted to cooperate with a cassette unloader for dispensing film sheets into a storage module. The storage module includes a light tight housing having a film access slot therein. A drum and spool are mounted within the housing for rotation about spaced parallel axes. A web of opaque material terminally secured to the drum and spool extends around an intermediate guide roller. A film sheet dispensed from the cassette into the unloader is directed by guide means therein onto the web within the storage module. A motor mounted on the unloader is coupled to a drive gear which operatively engages a pick-up gear coupled to the storage module drum. Actuation of the unloader is controlled by a sensor mounted adjacent the film sheet path so that as a film sheet moves through the unloader, the motor is actuated to rotate the drum to thus wind the web thereon with the film

sheet being wound between the web turns. In this manner, a multitude of exposed but unprocessed film sheets of various sizes can be stored. The storage module is portable and can be moved out of cooperative relationship with the unloader in cooperation with an X-ray film sheet processor. A processor adaptor module at the processor carries a motor driving a gear engageable with a spool pick-up gear in the storage module. Energization of the processor adaptor motor winds the web back from the drum to the spool to thus dispense film sheets one at a time from the web into the processor entrance slot.

3,715,088
STRIP STORAGE DEVICE

Arthur C. Rissberger, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 29, 1970, Ser. No. 50,769
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **6 Claims**

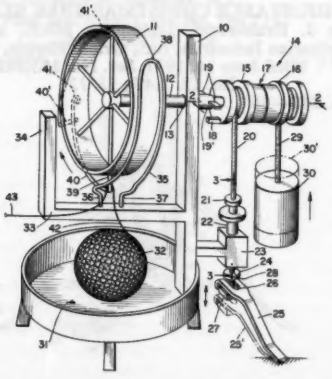


1 A film spool including a hub cavity formed in the hub. A film slot is provided in the hub and communicates with a channel formed in the cavity to hold the film end during take-up onto the spool. The channel is comprised of a raised rib formed in spaced relationship from a portion of the cavity sidewall. The rib cooperates with the sidewall to force the film end into an arcuate path and restrains the film end from springing back out through the film slot during take-up.

3,715,089
SPIN OFF WHEEL FOR CROCHETING

Howard A. Stevens, Thousand Oaks, Calif., assignor of a fractional part interest to Stanley H. Stevens, Hatboro, Pa.

Filed Dec. 23, 1971, Ser. No. 211,322
Int. Cl. B65h *49/00;* **D01h** *7/16*
U.S. Cl. 242—129.5 **7 Claims**

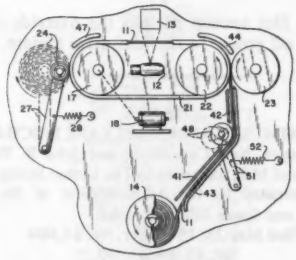


A wheel is rotatably mounted with a thread receiving opening on its periphery for receiving the end of thread from a ball of yarn. A stationary guide leads the thread into the thread receiving opening so that oscillation of the wheel pulls off a length of thread from the ball of yarn to provide slack in the thread. The oscillation of the wheel may be effected by a foot treddle so that a person crocheting need not use his or her hands for pulling off slack thread.

3,715,090
DEVICE FOR ADVANCING A WEB OF FLEXIBLE STRIP MATERIAL

Karl H. Kostusiak, Pittsford, and Lynn A. Selke, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1970, Ser. No. 9,172
Int. Cl. G11b *15/18, 15/32;* **B65h** *17/26*
U.S. Cl. 242—188 **11 Claims**



An advance mechanism for a web of flexible strip material utilizes a flexible, transparent carrier belt having a web receiving channel therein. The web is trapped in the channel and is supported by the belt as it is moved thereby through the transducer area. A circuit for controlling the belt advance, and thereby the web advance, includes a differential optical detector for observing the position of a reference mark on the web after the web has been advanced. Deviation from the desired position of the mark causes the generation of an error signal which in one embodiment actuates the advance mechanism to correct the error. In another embodiment, the error signal is used to cause the following advance step to be either greater or lesser than normal depending upon the direction of deviation.

3,715,091
FILM TENSION SENSING SYSTEM FOR USE ESPECIALLY IN ELECTRICALLY DRIVEN AUTOMATIC STEP AND REPEAT CAMERAS

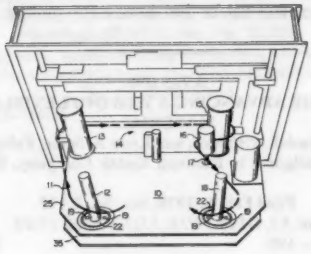
Jacobus van Vonderen, Covina, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Mar. 1, 1971, Ser. No. 119,468
Int. Cl. B65h *59/38;* **G03b** *1/02;* **G11b** *15/13*
U.S. Cl. 242—191 **9 Claims**

A film tension sensing system for use especially in electrically driven automatic step and repeat cameras.

The system comprises a film supply spool rotation direction sensor and film tensioner in conjunction with a rotatable film supply spool shaft, and a film tension sensor in conjunction with a film take-up spool shaft. The film supply spool shaft is coupled to a film supply spool rotatably mounted thereon by one or more spring biased drive pins which engage drive holes in the supply spool. The supply spool rotation direction sensor includes an override switch which cuts off electrical power to the film drive system when the supply spool rotates in the wrong direction. The film tension sensor employs a roller rotatably mounted on a non-rotating pivotally

mounted shaft. Positive film tension on the sensor roller pivots the shaft to engage and close an override switch



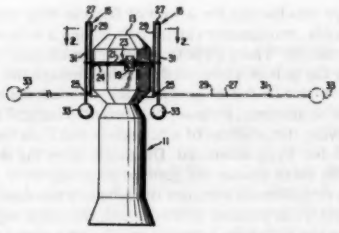
while lack of film tension permits the override switch to open and cut off power to the film drive system.

3,715,092

DELAYED SIMULTANEOUS RELEASE MECHANISM

Xopher W. Moyer, New Carrollton, and John B. Webb, Annapolis, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 28, 1970, Ser. No. 41,404
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SS **10 Claims**



The disclosed appendage release mechanism is particularly adapted for use with spacecraft operating with despin mechanisms and releasable appendages. It includes a flexible loop and a plurality of appendage releasing devices which are attached to the flexible loop. The appendage releasing devices are made up of piston-cams and ball latches which hold the appendages as long as the flexible loop is maintained in a taut condition but which release the appendages upon relaxation of the flexible loop. The flexible loop remains taut as long as the despin weights, which weights are attached to the flexible loop by cords, remain attached but relaxes when the despin weights are released.

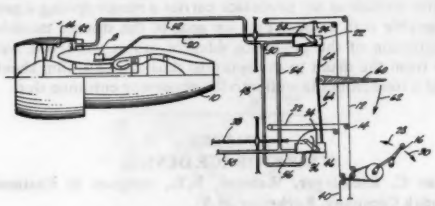
3,715,093

AUTO-ADVANCE THROTTLE CONTROL

Roscoe H. Van Dyke, Santa Ana, Calif., assignor to McDonnell Douglas Corporation

Filed Dec. 27, 1971, Ser. No. 212,443
Int. Cl. B64c *13/16*
U.S. Cl. 244—76 B **7 Claims**

A system compensating for sudden and unexpected loss of thrust resulting from engine failure in a short takeoff and landing (STOL) aircraft in a high angle of attack attitude, such as in the landing mode, by advancing the throttle of an adjacent engine on the same side of the longitudinal centerline of the aircraft as the faulty engine. An overcenter actuating mechanism combines amplification of a small signal source



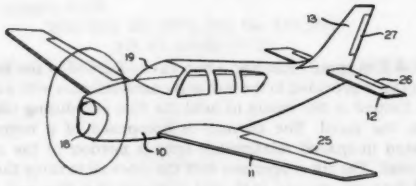
with rapid rate of response. The small signal force results from comparison of adjacent engine selected parameters.

3,715,094

SIMPLIFIED AIRCRAFT CONTROL SYSTEM

Robert L. Cohn, c/o Robert L. Cohn, Inc., 500 N. Michigan Ave., Chicago, Ill.

Filed June 5, 1970, Ser. No. 43,663
Int. Cl. B64c *13/04*
U.S. Cl. 244—83 B **8 Claims**



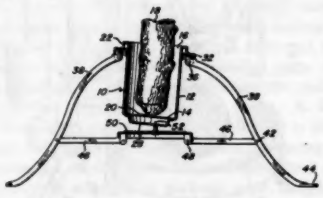
A control system resiliently interconnects aileron and rudder controls. When the aileron is controlled, the rudder is trimmed sufficiently to maintain a desired bank and turn orientation without separately controlling the rudder. For stall minimization the elevator is restricted from moving up to the position where the angle of attack of the air foil is at the burble point.

3,715,095

ADJUSTABLE CHRISTMAS TREE STAND

William J. Drablowski, Ludington, Mich., assignor to Wolverine Industries, Inc., Grand Rapids, Mich.

Filed June 16, 1971, Ser. No. 153,589
Int. Cl. A47g *33/12*
U.S. Cl. 248—46 **16 Claims**

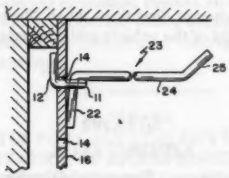


A receptacle for attachment to the end of a Christmas tree trunk is loosely and removably receivable in and peripherally supported from an upper supporting ring

of a collapsible stand. A platform carried by the legs of the stand is movable relative to the supporting ring and carries an upstanding pin which is receivable within one of a plurality of perforations provided in the bottom portion of the receptacle for further supporting the receptacle and maintaining it in adjusted position relative to the stand.

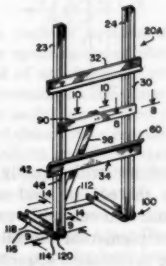
3,715,096
ARTICLE SUPPORT
Wilbur C. Filbert, 113 Tapawingo Road SW., Vienna, Va. 22180
Filed June 18, 1971, Ser. No. 154,489
Int. Cl. A47f 5/00
U.S. Cl. 248—223 **17 Claims**

An article support for use with a pegboard having horizontal rows of uniformly spaced holes therein comprising a base with integrally formed legs thereon spaced a distance equal to the distance between centers of the holes in said horizontal rows of holes or any multiple thereof and adapted to be received within the holes within said pegboard, the base having at least one rectangular aperture therein adapted to detachably receive and rotatably suport a rectangular end portion extending angularly from a body portion of a hook member so the legs, base and end portion cooperate to support said hook member on said pegboard. A plurality of angularly spaced rectangular apertures may be provided at each hook position



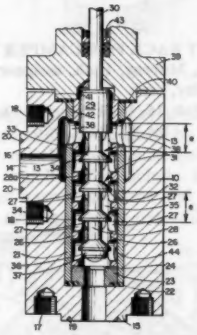
whereby the hook member may be supported by said base at selected angle relative to said pegboad. The end portion of the hook member may be provided with corresponding and angularly off-set rectangular portions separated by a cylindrical portion whereby the hook member may be angularly adjusted relative to the pegboard within a single rectangular aperture in the base.

3,715,097
ADJUSTABLE EASEL
John Kalajian, 340 Starr St., Brooklyn, N.Y.
Filed Jan. 7, 1971, Ser. No. 104,722
Int. Cl. A47b 97/04
U.S. Cl. 248—449 **3 Claims**



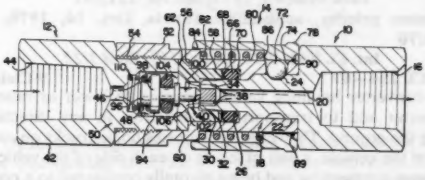
An adjustable easel for supporting a rectangular stretcher frame for canvas has a frame comprising a pair of vertical channel shaped rails with longitudinal slots in front sides. Upper and lower angle bars extend transversely across the rails and are adjustably positioned by bolts engaging clamp blocks inside the rails. A palette is removably mounted on the lower angle bar. A stand can be provided for adjustably supporting the easel frame in various angular positions. The palette support may have a removable platform and a removable plate for supporting paint tubes.

3,715,098
ADJUSTABLE FLUID RESTRICTOR METHOD AND APPARATUS
Hans D. Baumann, 29 Villa Drive, Foxboro, Mass.
Filed July 6, 1971, Ser. No. 159,769
Int. Cl. F16k 47/00
U.S. Cl. 251—121 **15 Claims**



The present invention constitutes an adjustable fluid restrictor providing throttling means to reduce pressure of liquid or gaseous media through a process of adiabatic flow with friction in contrast to conventional orifice type throttling devices which utilize rapid acceleration and deceleration as primary means of energy conversion. Said adjustable fluid restrictor containing labyrinth-type restrictions which are adjusted by conventional actuating means and provide constant enthalpy pressure reduction at substantially constant velocity regardless of variations in flow area.

3,715,099
VALVED QUICK-DISCONNECT COUPLING
Ashok S. Shendure, Warrensville Heights, Ohio, assignor to Crawford Fitting Company, Solon, Ohio
Filed June 2, 1971, Ser. No. 149,162
Int. Cl. F16l 29/00, 37/28
U.S. Cl. 251—149.1 **1 Claim**



The specification and drawings disclose a quick disconnect tube coupling which includes a female body member with an axially extending bore defining a flow passage and an internal valve chamber. A resilient sleeve member is

positioned within the chamber and forms an annular valve seat. A male body member is associated with the female body member and includes a cylindrical stem portion of reduced diameter and a flow passage extending axially through the stem. The diameter of the stem is sized so as to be closely received within the bore of the female body portion. Positioned within the valve chamber and biased toward the seat and the stem is a plug valve member of stepped diameter with a reduced diameter portion that extends through the valve seat. The diameter of the plug's reduced diameter portion is substantially less than the diameter of the valve seat and the diameter of the end of the stem. The end of the stem is provided with flow passage openings which are located radially outward at a distance greater than the maximum diameter of the reduced diameter end portion of the plug member.

3,715,100

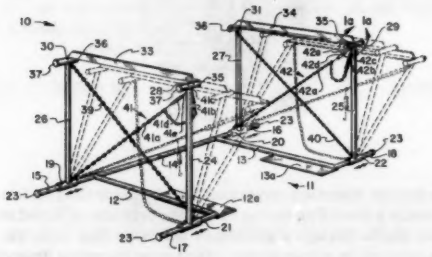
SUPPORT RACK FOR CAMPER BODIES

Calvin D. Spencer, Murray, Utah, assignor to Rax Corporation, Salt Lake City, Utah

Filed Feb. 16, 1971, Ser. No. 115,191

Int. Cl. B66f 7/26

U.S. Cl. 254—49 **7 Claims**



A support rack for camper bodies and the like, having pivotally interconnected parallelogram frames, frame locking means and flexible frame holding means. The parallelogram frames pivot within the limits of the flexible frame holding means to move a camper body onto and off of a truck bed as the truck is moved and the frame locking means hold the parallelogram frames rigid to support the camper body in an elevated position.

3,715,101

CONVERTER HANDLING VEHICLE

Othmar Puhringer, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwertze Aktiengesellschaft, Linz, Austria

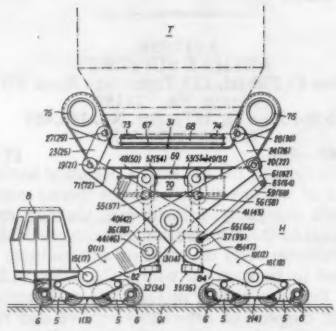
Filed March 8, 1971, Ser. No. 121,991

Claims priority, application Austria, Oct. 14, 1970, A 9254/70

Int. Cl. B60s 9/14; B60p 1/48; B66f 3/22

U.S. Cl. 254—87 **9 Claims**

A converter handling vehicle adapted to lower or raise a converter and to transport the converter in any direction along the ground. The vehicle comprises bogie trucks on each side of the vehicle, a pair of levers on each side of the vehicle, the arms intersecting and being pivotally connected to a point between the ends of the levers, the lower ends being connected to the bogie trucks, a converter holding member that is pivotally connected to the upper ends of the levers, hydraulic cylinders and piston rods connected to the levers to raise or lower the converter, a support plate rotatably mounted under the holding member to support the vehicle and the converter when the direction of travel is to be changed, and a driver to cause the converter and the vehicle to rotate about the support member to change directions when the support member supports the weight of the vehicle and converter.



3,715,102

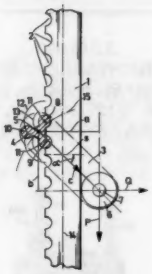
LIFTING JACK

Ferdinand Braselmann, Ennepetal-Oberbauer, Germany, assignor to Firma Ferd. Braselmann, Ennepetal-Oberbauer, Kotthausstrase, Germany

Filed Mar. 2, 1971, Ser. No. 120,105

Int. Cl. B66f 3/08

U.S. Cl. 254—96 **8 Claims**



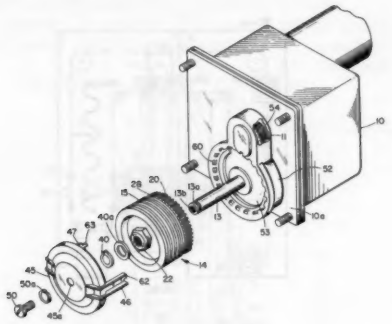
A jack having a column with equally vertically spaced notches on one side thereof, a load supporting carrier slides along the column and rotatably supports a member having projections complementary to said notches. As the member is rotated the projections sequentially engage said notches and when two adjacent projections are seated in adjacent notches the supported load acts along an oblique line between said projections whereby the carrier and load are self-locking on the column.

3,715,103

GEAR AND CAPSTAN GUARD FOR FLIGHT CONTROL SERVO

Luis Enrique Carreras, Ft. Lauderdale, Fla., assignor to The Bendix Corporation

Filed June 24, 1971, Ser. No. 156,224
Int. Cl. B66d *1/30*
U.S. Cl. 254—150 R **4 Claims**



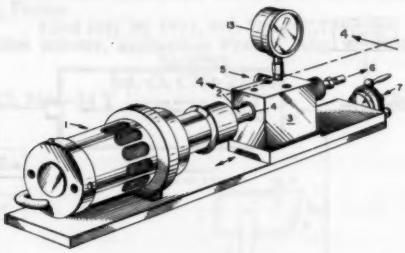
A capstan pulley coaxially driven through a slip clutch by a first gear which in turn is driven by a second gear. A gear guard which covers the gear train so as to prevent a capstan cable from becoming enmeshed therein includes a plurality of lock tab slots which cooperate with a capstan guard to permit the capstan guard to be locked over the capstan in any one of a plurality of positions.

3,715,104

APPARATUS FOR CARRYING OUT ULTRASONIC AGITATION OF LIQUID DISPERSIONS

Eric Charles Cottell, Windermere, Bayville, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,263
Int. Cl. B01f *11/02*
U.S. Cl. 259—1 R **5 Claims**



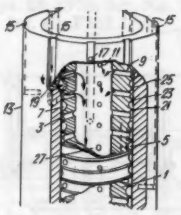
Liquid systems, such as aqueous dispersions of cells, are passed across the space between plates, one of which is attached to the end of an ultrasonic probe. The other plate is stationary and mounted in a container which permits carrying out the operation under any desired pressure. The plates are spaced the desired distance for maximum efficiency and there are two liquid conduits into the container, one at the side and directed across the space, and the other axial. One or both plates may be provided with baffles, such as spiral baffles or labyrinths to keep the liquid flowing thereover in the ultrasonic zone for a sufficient time. The direction of flow of the liquid is important, and the best results are obtained if the liquid flows in the inlet conduit across the plates and out the axial conduit instead of the reverse. Efficiency is greatly increased, and certain very tough cells, such as yeast cells, can be ruptured with relatively small outputs of energy.

3,715,105

HOMOGENISING

Thomas Reuben Griffin, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 5, 1970, Ser. No. 1,072
Claims priority, application Great Britain, Jan. 10, 1969, 1,664/69
Int. Cl. B01f *15/02*
U.S. Cl. 259—2 **3 Claims**



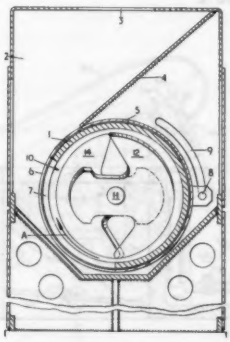
Process and apparatus whereby a mixture comprising a liquid is sheared and homogenised by passing it through dimensionally precisely pre-defined paths arranged in a parallel system which paths include dimensionally precisely pre-defined narrow sections and wherein the walls of said narrow sections are in controlled relative movement one with the other.

3,715,106

FEED ARRANGEMENTS FOR A MIXER OR MIXER-CONVEYOR UNIT

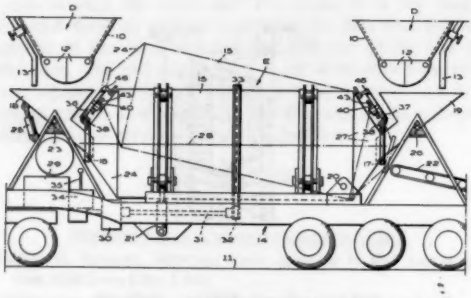
Albert Edwards, Peterborough, England, assignor to Baker Perkins Limited, Peterborough, England

Filed Jan. 11, 1971, Ser. No. 105,422
Claims priority, application Great Britain, Jan. 27, 1970, 3,983/70
Int. Cl. B01f *7/02*
U.S. Cl. 259—25 **5 Claims**



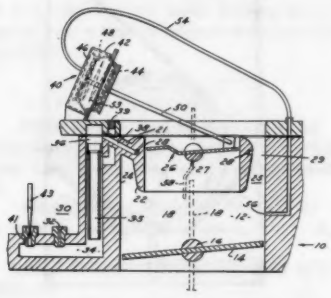
A feed arrangement for providing a controlled rate of feed of free-flowing material to a screw-type conveyor. The arrangement consists of a gate opening in the side of the conveyor barrel, a sliding sleeve around the barrel leaving an opening adapted to register with the barrel opening to a varying degree dependent on the position of the sleeve, and a supply enclosure above the barrel with a partition for directing material towards the gate.

3,715,107
TRANSIT CONCRETE MIXER AND METHOD OF MIXING CONCRETE COMPONENTS
Hugh P. Paris, 3101 Middlefield Road, Palo Alto, Calif.
Filed March 9, 1972, Ser. No. 233,041
Int. Cl. B28c 5/18
U.S. Cl. 259—148 10 Claims



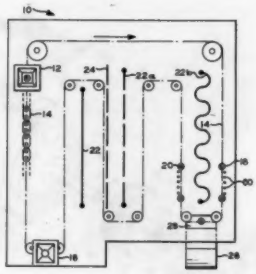
A transit concrete mixer and method of mixing concrete components, wherein a rotatable drum is provided with a series of inclined blades on its interior, the blades being disposed to move concrete components delivered to the interior of the drum toward the center of the drum when the drum is rotated in one direction and to move them toward an end of the drum when the drum is rotated in the opposite direction. The concrete components may be delivered to the drum through either one or both ends thereof, and the mixed concrete components may be discharged from an end of the drum when the latter is rotated in the opposite direction.

3,715,108
STAGED SINGLE VENTURI CARBURETOR
Ronald T. Denton, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed May 7, 1971, Ser. No. 141,181
Int. Cl. F02m 9/08
U.S. Cl. 261—50 A 9 Claims



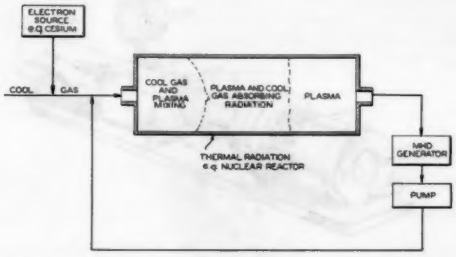
A downdraft type carburetor induction passage has a throttle valve above which is a coaxially mounted flow controlling member consisting of a fixed area venturi integrated with a movable venturi bypass valve member to provide high fuel metering signals at low air flows and high air flow potential for wide open throttle operation.

3,715,109
RAPID HEATING OF PARISON PREFORMS
Dixie E. Gilbert, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed May 13, 1971, Ser. No. 143,006
Int. Cl. F27b 9/24
U.S. Cl. 432—122 9 Claims



Tubular parison preforms are heated to orientation temperature by means of external radiant heat combined with affirmative heating of the parison on the inside.

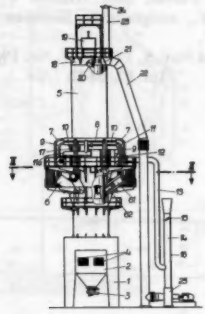
3,715,110
RADIANT HEATING OF GAS STREAMS
Carl A. Jensen, Davis, and Lowell L. Wood, Jr., Simi, Calif. (both of Department of Geophysics and Planetary Physics, % University of California, Los Angeles, Calif. 90024)
Continuation-in-part of application Ser. No. 706,590, Feb. 19, 1968. This application Jan. 27, 1969, Ser. No. 794,265
Int. Cl. F27f 17/00
U.S. Cl. 432—29 8 Claims



This disclosure is concerned with a novel process for rapidly heating a gas stream to a specific range of very high temperatures by introducing said gas stream together with electrons or a source thereof into a heating zone which is subjected to thermal radiation and which contains a substantial quantity of a hot plasma which is preferably maintained under pressure.

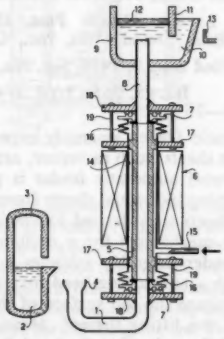
The gas stream entering the heating zone mixes with the hot plasma and absorbs heat therefrom as well as from the walls of the heating zone itself by radiation. The heated plasma is then withdrawn from the heating zone at a rate such that the amount of plasma in the heating zone remains substantially constant.

3,715,111
SHAFT LIME KILN
Felix Sobek, Friedrichstrasse 37, Dusseldorf, Germany
Filed Oct. 26, 1970, Ser. No. 84,107
Claims priority, application Germany, Mar. 9, 1970, P 20 10 974.4
Int. Cl. C04b *1/00*
U.S. Cl. 432—4 18 Claims



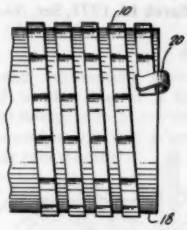
In a process for calcining and sintering granulated, crushed or shaped material in a completely enclosed kiln, a treated lean gas at very low pressure is used as the fuel. The progress of combustion for extending the firing zone is controlled by altering the calorific value of the lean gas. Further, the kiln atmosphere is controlled on the basis of separate and independent regulation of the pressure and volume of the waste gas generated in the combustion and in the de-oxidizing processes as well as by supplementary reactions during combustion.

3,715,112
MEANS FOR TREATING A LIQUID METAL AND PARTICULARLY ALUMINUM
Henri Carbonnel, Antony, France, assignor to Groupement Atomique Alsacienne Atlantique, Plessis Robinson, France
Filed July 30, 1971, Ser. No. 167,736
Claims priority, application France, Aug. 4, 1970, 7028793
Int. Cl. C22b *21/06*
U.S. Cl. 266—34 T 9 Claims



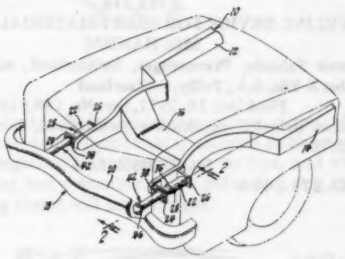
Apparatus for treating liquid metal, such as aluminum, with a gas, comprising an input pipe and an output pipe connected together by the conduit of an electromagnetic pump. The conduit is made of a porous refractory material arranged inside a fluid-tight tube receiving the treating gas under pressure. The treating gas entering the conduit is intimately mixed with the liquid metal by the currents induced by the windings of the pump.

3,715,113
PISTON RING EXPANDER
James V. Walker, Redondo Beach, Calif., assignor to McDonnell Douglas Corporation
Filed Sept. 28, 1970, Ser. No. 76,134
Int. Cl. F16f *1/34*
U.S. Cl. 267—1.5 5 Claims



A helical piston ring expander for use with plastic or plastic-like piston rings is constructed by crimping a strip of metal, spirally winding the crimped strip around a cylindrical mandrel into a helix, heat treating the resultant assembly and cutting portions therefrom at predetermined points therealong to form the desired expander.

3,715,114
SHOCK ABSORBING BUMPER
Claude A. Thorsby, Saginaw, and Robert L. White, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 7, 1971, Ser. No. 187,418
Int. Cl. B61f *19/02, 19/04*; F16f *9/30*
U.S. Cl. 267—140 4 Claims



An energy absorbing support unit for an automobile bumper bar, the support unit including a pair of telescopically related tube members adapted for disposition between the bumper bar and the vehicle chassis, an orificed piston rigidly attached to one tube member and adapted to effect throttled flow of an incompressible medium situated in a chamber in the other tube member to effect energy absorption, a free piston slidably mounted in the one tube member and resiliently biased toward a normal position corresponding to a fully ex-

tended position of the one tube member, the free piston urging reverse flow of the incompressible medium to provide a self-restoring preload on the one tube member, and a reciprocating valve member on the free piston movable between an open position and a closed position partially obstructing the piston orifices to increase the rate of energy absorption. The free piston, in the normal position thereof, engages the valve member to positively locate the latter in the open position whenever the one tube member is in its fully extended position.

3,715,115

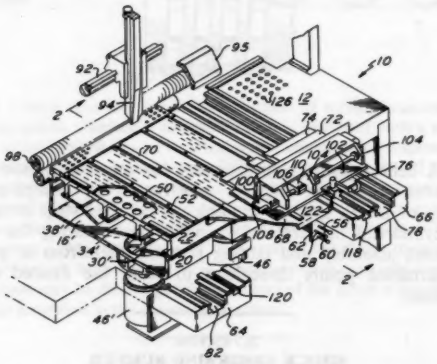
SHEET FEEDING APPARATUS

William Grobman, Philadelphia, Pa., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed March 15, 1971, Ser. No. 124,076

Int. Cl. B65h 1/06

U.S. Cl. 271—44 A **22 Claims**



Sheet feeding apparatus of the bottom feed type is disclosed. Stationary vacuum chambers are used to flatten out the sheets prior to feeding. Some of the vacuum chambers are provided with valve means to control the pressure effect on the juxtaposed portion of the sheet.

3,715,116

LEVELING DEVICE FOR SHEET MATERIAL FEEDING MECHANISM

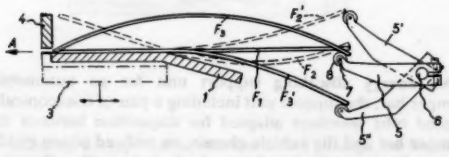
Gennaro Salvade, Preverenges, Switzerland, assignor to J. Bobst & Fils, S.A., Prilly, Switzerland

Filed Oct. 15, 1971, Ser. No. 189,510

Claims priority, application Switzerland, Oct. 20, 1970, 15505/70

Int. Cl. B65h 1/06

U.S. Cl. 271—44 A **8 Claims**



A levelling device for cardboard sheet material and the like located at a feed station of a sheet material processing station to assure that the forward marginal area of each sheet lies flat on the feed surface of the processing machine. It is particularly concerned with sensing whether both the forward edge of a sheet as well as a portion of the sheet spaced a short distance rearwardly of the forward edge are lying flat on the feed surface; and if not, raising or lowering the rear edge of the sheet until the forward marginal edge is lying flat on the feed surface.

3,715,117

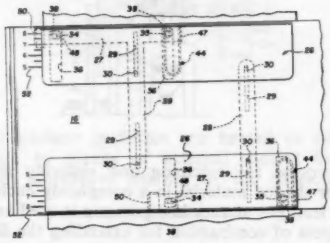
ADJUSTABLE SHEET GUIDE APPARATUS

Anthony P. Di Fulvio, and William C. Wilson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1971, Ser. No. 195,958

Int. Cl. B65h 1/04

U.S. Cl. 271—61 **7 Claims**



Document side guides seated on opposite sides of a receiving shelf of a document feeder are spring biased in the longitudinal direction of the receiving shelf so that a wedge-shaped brake pad attached to each of the side guides normally engages a wedge-shaped receiving bracket attached to the underside of the receiving shelf. When the brake pads are disengaged from the wedge-shaped brackets by manually pushing the side guides against the bias of the springs, the side guides are free to move laterally to the extremes of pin slots located in the receiving shelf. When the side guides are released, the springs return the side guides to the wedging mode, thus braking the guides as positioned.

3,715,118

SHEET SEPARATOR AND FEEDER ASSEMBLY

Charles L. Larson, Grants Pass, Oreg., assignor to Jeddeloh Bros. Sweed Mills, Inc., Gold Hill, Oreg.

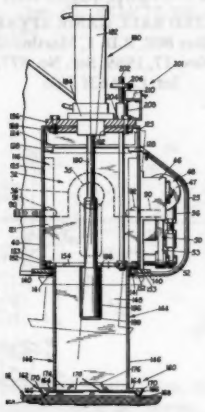
Filed Dec. 3, 1970, Ser. No. 94,643

Int. Cl. B65h 3/08, 3/46

U.S. Cl. 271—26 R **4 Claims**

An automatic feeder assembly especially adapted for handling thin sheets, such as veneer, arranged in stacks. A vacuum-operated automatic feeder is provided for separating and lifting individual sheets from a stack and transferring the sheets to a desired location, such as the inlet of a loading mechanism for a multideck conveyor. The automatic feeder assembly includes a vacuum manifold provided with a telescoping head for each stack of sheets, adapted to engage the top surface of the uppermost sheet on the stack for lifting thereof. Means are provided for elevating and then plunging the head down with the upper sheet retained thereon, for separating the sheet from any lower sheets that are adhered thereto. The manifold and the sheet are then tilted to further ensure separation of the sheet from any lower sheets, and driven forward until

the leading edge of the sheet is engaged by the inlet rollers of a loading mechanism. A plural array of telescoping



heads can be arranged in side-by-side relationship to service multiple stacks of sheets.

3,715,119

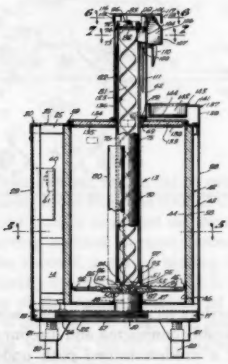
AUTOMATIC ICE DISPENSER

George R. Shelley; Robert J. Shelley, Jr.; Arthur B. Dixon, and Bruce House, all of 4225 N. W. 72nd Avenue, Miami, Fla.

Continuation-in-part of Ser. No. 862,587, Aug. 25, 1969, Pat. No. 3,608,786. This application May 4, 1970, Ser. No. 34,280

Int. Cl. G01f *11/20*

U.S. Cl. 222—241 **9 Claims**



An ice dispenser for automatically dispensing crushed ice fed from an ice bin to a delivery opening of the ice bin in response to actuation of a push-plate beneath the opening is described. Crushed ice is lifted from the ice bin by means of an ice-elevating mechanism in the form of an auger having an ice feeder disc at its lower end and a stationary auger tube within which the auger turns for elevating the ice. The auger and its feeder disc are driven at the bottom through a drive pin mechanism journalled in the bottom of the ice bin and releasably connectable with the drive pin mechanism to permit removal and disassembly of the ice-elevating mechanism for cleaning.

3,715,120

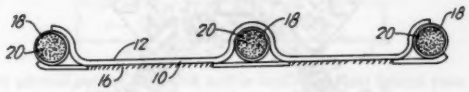
CHILD'S SLIDE

Fred R. Peltola, 67-41 211 Street, Bayside, N.Y.

Filed July 20, 1970, Ser. No. 56,371

Int. Cl. A63g *21/04*

U.S. Cl. 272—56.5 R **5 Claims**



An exercising and amusement slide adapted to be detachably secured to the side of a hill and to extend downward with a flat flexible runner providing the sliding surface and means secured to opposite edges of the runner to form protective guide rails therefor.

3,715,121

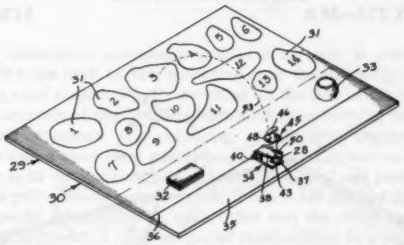
TARGET AND PROJECTING APPARATUS INCLUDING A BALANCED PROJECTILE

Neil R. Renn and Madeline S. Renn, both of 2020 North St., Harrisburg, Pa. 17103

Filed July 2, 1971, Ser. No. 159,302

Int. Cl. A63b *71/02*

U.S. Cl. 273—101 **1 Claim**



A game that includes a playing surface, a springboard, cards, tokens, and a figure that is adapted to be propelled by the springboard onto the playing surface, and wherein the figure or body member has a balancing ring thereon for assuring that it will land upright.

3,715,122

GAME TABLE

Theodore G. Brown, 4401 Lantana Ave., Sacramento, Calif. 95824

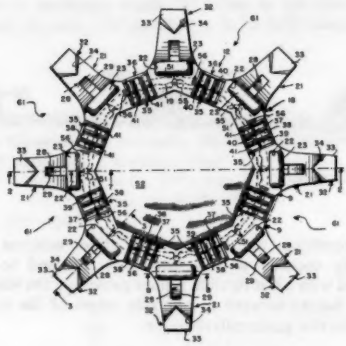
Filed Feb. 23, 1971, Ser. No. 117,886

Int. Cl. A63f *3/00*; A47b *13/00*

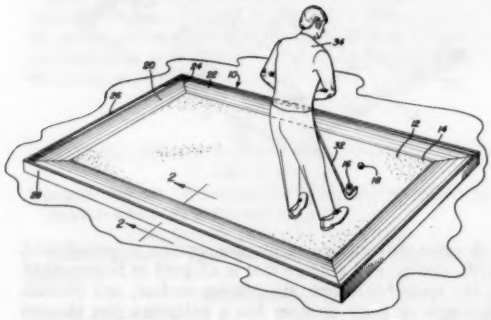
U.S. Cl. 273—136 Z **9 Claims**

A game table for the playing of card games involving the use of chips and which is especially intended for com-

mercial card rooms. The table includes a detachable rim portion divided by circumferentially spaced outwardly and downwardly projecting arms into sections or stations, each located between adjacent arms, one of which is allotted to each player, thus preventing any player from occupying more than his allotted space. Each station contains facilities to accommodate a drinking glass, an ashtray, chips and matches, as well as a conveniently located arm rest.

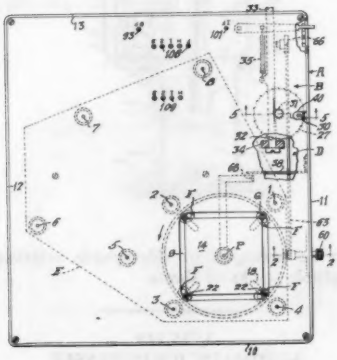


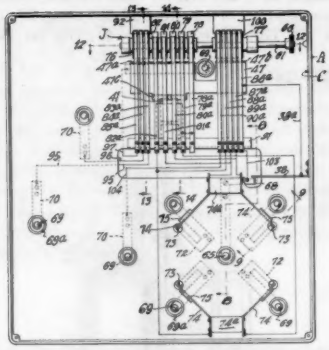
3,715,123
GOLF GAME DEVICE
Donald J. Baum, 3402 Curtis Drive, Hillcrest Heights, Md.
Filed Dec. 16, 1971, Ser. No. 208,716
Int. Cl. A63b *69/36, 67/02*
U.S. Cl. 273—35 R **3 Claims**



A game device in the form of a generally rectangular playing surface of generally planar construction for receiving two or more golf balls with one of the balls being white and to be struck by a golf putter and the other ball to be distinguishably colored and forming an object ball. The playing surface is provided with a covering material simulating the putting green surrounding a hole in a golf course and the playing area is surrounded by an upwardly slanted peripheral wall terminating in an upwardly and slightly inwardly inclined rail by which a game may be played and points scored in accordance with a set of rules when the white golf ball is struck by a putter and caused to contact the colored or object ball after it has been banked off of the slanted peripheral wall in a predetermined manner.

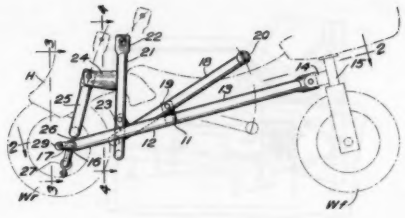
3,715,124
SIMULATED BALL GAME APPARATUS
George A. Swartz, Box 808, R.D. 1, Martinsville, N.J.
Filed Nov. 17, 1969, Ser. No. 877,179
Int. Cl. A63f *7/06*
U.S. Cl. 273—93 R **3 Claims**





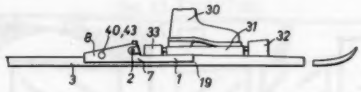
Game piece carriers to and from which selectively a game piece can be separably connected and disconnected manually, are moved over a predetermined path under control of a player through successive offensive plays directed by a player operated indicator. Selectively operable defensive play means through a continually changing chance mechanism are either active or inactive and each thereof has associated therewith an indicium which may be designated by rules of play as correlated with a selected indicium on the offensive play indicator, the chance mechanism being changed by and with the mechanism for moving the game piece carriers. Also included are selectively operable defensive play indicating means, and means for actuating one thereof in response to operation of a defensive play means which is energized when so actuated. The separable connection of the game pieces to the carriers permits movement of the game pieces from one carrier to another in simulation of base stealing.

3,715,125
LINKAGE MECHANISM FOR RIDER PROPELLED TOYS
William E. Payne, 1204 Alpine Road, Walnut Creek, Calif. 94596
Filed Dec. 10, 1971, Ser. No. 206,759
Int. Cl. A63g *17/00*
U.S. Cl. 280—1.194 **2 Claims**



A toy horse, propelled by the rider, which simulates the loping action, characteristic of horses, as it moves in a forward direction. The actuating force is provided by the rider and consists of a cyclic combination of muscular action and applied weight. The propelling mechanism is so designed as to eliminate the usual tendency of such devices to become "hung up" on center.

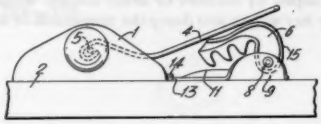
3,715,126
DEVICE FOR CATCHING A RUNAWAY SKI
Gunter Schwarz, Pflugstrasse 6, Zurich, Switzerland
Filed July 22, 1970, Ser. No. 57,289
Claims priority, application Switzerland, July 22, 1969, 11212/69
Int. Cl. A63c *7/10*
U.S. Cl. 280—11.13 B **6 Claims**



A catching device for use with a ski to prevent its running away upon becoming loose from the foot of the skier comprising an axle, a yoke fixedly mounted on the axle for rotation therewith and having a shank portion extending beyond the axle at both sides thereof, a spring biasing the axle and the shank portion thereby in a direction which is transverse to the general direction of the running surface of a ski, when the catching device is mounted on a ski, and pointing downward from the running surface, thereby engaging the snow and braking the movement of the ski.

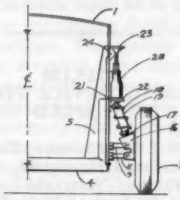
3,715,127
SKI BINDING WITH CLAMPING BAIL
Bror With, Olaf Schous vei, 4, Oslo 5, Norway
Filed Jan. 25, 1971, Ser. No. 109,222
Claims priority, application Norway, Feb. 2, 1970, 366/70; Oct. 15, 1970, 3895/70
Int. Cl. A63c *9/20*
U.S. Cl. 280—11.35 B **10 Claims**

In a ski binding of the toe binding type having a clamping bail engaging the sole rim and pivoted in a toe iron, and a toothed hook engaging a transverse portion of the bail and pivoted at an axis in a structurally defined distance from the pivotal axis of the bail, the hook has on its front side a corrugated edge onto which the said transverse portion can be pressed firmly in an inwardly turned inoperative position of the hook. The pivotal support for the hook is integral with the toe iron or engages a forward portion of the same. In the latter case it is attached to the ski by only one screw located behind



the pivotal axis of the hook and is locked against lateral rotation by engaging the bottom plate of the toe iron. The said transverse portion of the bail is the bight portion of the same or a cross-bar interconnecting the legs of the bail at bends forming downwardly and inwardly facing angles, while the bail has an outward spring bias.

3,715,128
RETRACTABLE SUSPENSION AND RUNNING GEAR FOR TRAILERS
George W. Allen, 810 W. Limberlost Rd., and Charles S. Gray, 1127 E. 10th St., both of Tucson, Ariz.
Filed Aug. 16, 1971, Ser. No. 171,927
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.22 **4 Claims**

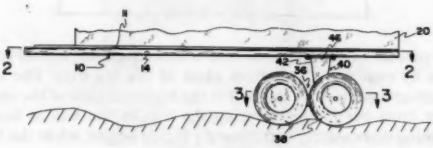


A retractable suspension and running gear is provided which lends itself to easy mounting upon the side walls of existing road trailers. Firmly mounted on the side of the trailer are two pairs of steel angular bars, such pairs forming vertical spaced channels for receiving in slidable engagement therewith a steel plate which may be locked in various positions in its vertical channels. A lower portion of said plate carries a pair of swing arms the ends of which are pivoted thereto in spaced relationship to each other and the other ends of which are pivoted (also in spaced relationship) to a substantially vertically disposed part of the wheel assembly which receives the lower end of a coil spring suspension member. The upper portion of the slidable plate is provided with means for receiving and securing the upper end of said spring member. The upper part of the steel channel assembly is provided with a suitable ledge against which a jack or other means may bear when downward force is applied to said spring receiving means on said slidable plate in order to move said plate into the designed vertical position. Locking means is provided to hold the slidable plate in such desired position. An indicator of proper tire pressure is actuated by one of the swing arms.

3,715,129
SUSPENSION SYSTEM
Ezra Cordell Lundahl, Idaho Falls, Idaho, assignor to Ezra C. Lundahl, Inc., Logan, Utah
Filed Feb. 22, 1971, Ser. No. 117,574
Int. Cl. B60g *5/06*
U.S. Cl. 280—104.5 R **5 Claims**

A bracket-supported suspension system for a hay wagon or the like capable of being operated over relatively rough ter-

rain, comprising method and apparatus which allow continuous ground contact of a plurality of support wheels over such irregular terrain as is encountered in day-to-day farming and further readily accommodates tilting of the vehicle in respect to the wheels to load or unload cargo. The apparatus is designed to absorb terrain irregularities such as or similar to those developed by furrows or small ditches without immobilizing the hay wagon and damp the magnitude of any such ir-



regularities transferred to the hay wagon. The illustrated suspension system comprises a tripod support including three wheels, two mounted in laterally-spaced relation to absorb lateral irregularities encountered by the wheel set and one mounted in longitudinally-spaced relation to the other two to absorb longitudinal terrain irregularities. All wheels float or travel over the ground with individual floatation area unaffected by the action of the single wheel action.

3,715,130

SHOCK ABSORBING DEVICE FOR PROTECTING A RIDER IN A HIGH SPEED VEHICLE SUCH AS AUTOMOBILE

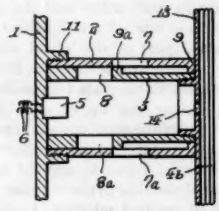
Ikuo Harada, 5–6–1 Minamisawa, Kurume-cho, Tokyo, Japan; and Masabumi Hamazaki, 5003–14 Midorigaoka, Nobeoka-shi; and Nobuyuki Isawa, 607–3 Midorigaoka, Nobeoka-shi, both of Nobeoka, Japan

Filed Nov. 2, 1970, Ser. No. 86,201

Claims priority, application Japan, Nov. 5, 1969, 44/88,060; Feb. 24, 1970, 45/15,187; Aug. 5, 1970, 45/68,009

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 AB **2 Claims**



A shock absorbing device designed to prop the rider's body in a collision of the vehicle and including a telescopically extensible structure or structures each comprised of a plurality of slidably interfitting tubular members. In a collision, high gas pressure is produced in the structure by gas producing means operable in association with a shock sensor provided therefore to cause the structure to extend quickly. Various forms of cushion or pad can be secured to one of the tubular members of the structure which extends outermost in operation to softly support the rider's body when it is thrown forward.

3,715,131

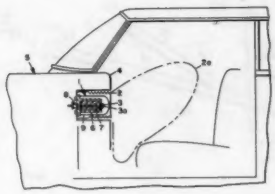
CHEMICAL GAS GENERATING DEVICE FOR AN AUTOMOBILE SAFETY SYSTEM

Eldon K. Hurley, Wharton; Robert S. Maule; Rocco C. Musso, both of Kenvil, and Lowell E. Smith, Bernardsville, all of N.J., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 35,795, May 8, 1970, abandoned. This application June 4, 1971, Ser. No. 149,981

Int. Cl. B60c *21/10*

U.S. Cl. 280—150 AB **13 Claims**



A gas generator capable of supplying sufficient gas to inflate an inflatable bag of a bag-type automobile safety system within the time limitations of the system is provided. A gas generating charge comprising a stabilized admixture of alkali or alkaline metal nitride and an ammonium salt is initiated to a sufficient reaction rate by an initiating charge extending substantially through the length of the gas generating charge to supply the necessary gases.

3,715,132

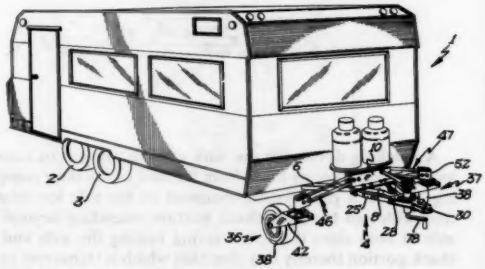
LOAD SUPPORTING CARRIAGE STRUCTURE FOR TRAILERS

Donald I. Denny, 2626 Loomis St., La Crosse, Wis.

Filed Feb. 24, 1971, Ser. No. 118,328

Int. Cl. B62d *53/04*

U.S. Cl. 280—405 R **10 Claims**

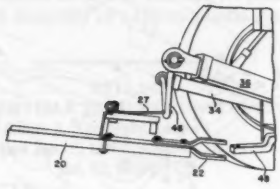


A wheeled carriage assembly for supporting the front end of trailer including a mounting beam assembly which is rigidly attached to the front end of a trailer, a draw bar assembly pivotally connected to the mounting beam for pivotal movement about a horizontal axis, and a pair of torsion bar units rigidly connected to the mounting beam assembly and extending laterally outwardly on opposite sides thereof, each of the torsion bar units being connected at its outer end to a caster wheel at a location offset from the center of the wheel. An elongated spring bar rigidly attached at one end to the aforesaid beam assembly and having its forward end engaged by a coupling on the front of the pivotal draw bar assembly limits relative vertical movement between the front end of the trailer and the rear end of a towing vehicle.

3,715,133
ATTACHMENTS PERMITTING A VEHICLE TONGUE TO BE LIFTED BY ACTUATION OF TRACTOR DRAFT LINKS

Richard Arthur Schafer, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 10, 1971, Ser. No. 141,904
Int. Cl. B60d *1/04*
U.S. Cl. 280—479 A 6 Claims

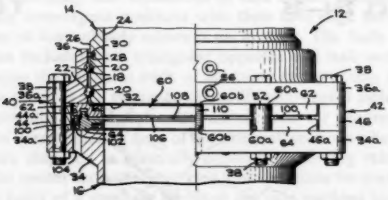


A two-wheeled vehicle and an agricultural tractor have cooperative attachments for permitting the tractor draft links to be operated to raise the tongue of the vehicle from the ground into position for connection to the tractor drawbar. Specifically, a spring member is fixed to the vehicle tongue, rearwardly of the forward end of the latter, and includes a free end portion extending forwardly above the tongue. A V-shaped pickup rod has its opposite ends received in ball connectors at the rear ends of the lift arms of the tractor and is adapted to liftingly engage the free end portion of the spring member.

3,715,134
PIPE SWIVEL JOINT WITH A CARTRIDGE-TYPE PACKING UNIT

Armand L. Faccou, Santa Ana, Calif., assignor to FMC Corpration, San Jose, Calif.

Filed June 25, 1971, Ser. No. 156,874
Int. Cl. F16l *27/00*
U.S. Cl. 285—276 8 Claims

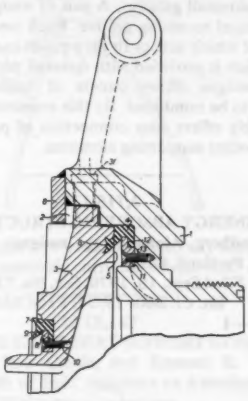


A pipe swivel joint with an annular cartridge-type packing unit for providing a fluid-tight seal between the joint's male and female relatively rotatable conduit elements. The female conduit element includes a pair of opposed radial flanges spaced axially to form an annular packing chamber, and one or more removable spacers between the flanges to permit installation and replacement of the packing unit without having to disassemble the joint. The axial dimension of the packing unit is adjustable, whether it is inside or outside the joint's packing chamber, to facilitate its contraction to less than the axial dimension of the packing chamber so that it can be easily slipped into and out of the chamber, and also its expansion when in the chamber into fluid-tight relationship with the joint's relatively rotatable elements.

3,715,135
SEALING MEANS FOR PIPES

Arthur Loftus Paddington, Radbrooke, England, assignor to British Ropes Limited, Doncaster, Yorkshire, England

Filed June 22, 1970, Ser. No. 48,211
Claims priority, application Great Britain, July 2, 1969, 33,488/69
Int. Cl. F16l *17/00*
U.S. Cl. 285—379 7 Claims

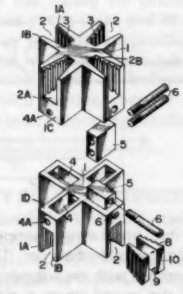


Sealing means for providing a fluidtight connection between two pipe sections. The sealing means comprises an annular housing arranged to be secured to one of the pipe sections, a floating ring mounted loosely in an annular recess in the housing so as to be capable of limited radial and axial movement relative thereto, and a resilient annular sealing member between the housing and the floating ring. The floating ring is arranged to make sealing contact with the other pipe section and, by virtue of its ability to move radially and axially relative to the housing, it can compensate for misalignment between the two pipe sections.

3,715,136
THICKNESS-ADJUSTABLE JOINT ASSEMBLY FOR BUILDING USE

Tsukasa Yoshida, Nikko Danchi 15-202, 1-3 Nikkoch, Fuchushi, Tokyo, Japan

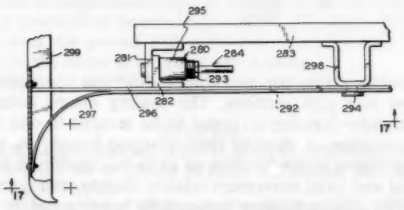
Filed Feb. 5, 1971, Ser. No. 113,019
Int. Cl. F16b *5/06*
U.S. Cl. 287—189.36 D 5 Claims



A joint assembly for the fabrication of building units, furniture, display cases and the like, including basically at least two

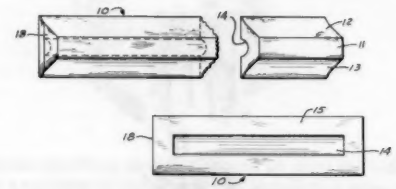
main joint bodies having a plurality of panel receiving grooves, each formed in a different direction, and a plurality of coupling grooves for combining the two main joint bodies. The coupling grooves are provided on the bottom of the joint main bodies and coupling pins are used to couple at least two such bodies with each other. The panel receiving grooves are each provided with two opposite side walls formed to have at least the forward and upper sides opened. The inner side faces of the respective side walls are inclined and provided with a plurality of dovetail grooves. A pair of wedges are associated with each panel receiving groove. Each wedge has two sides faces, one of which acts to fit on a panel end portion, and the other of which is provided with dovetail protrusions. The use of these wedges allows panels of uniform or different thicknesses to be combined. By this construction, the present joint assembly offers easy connection of panels without the need of any other supporting elements.

3,715,137
ENERGY ABSORBING STRUCTURES
Gary K. Sandberg, Aloha, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.
Filed Sept. 18, 1970, Ser. No. 73,403
Int. Cl. B60r *19/04*; F16d *63/00*
U.S. Cl. 293—1 **16 Claims**



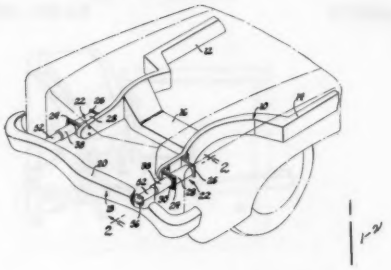
A fastener unit has a drawable rod and a retainer at one end of the shank and a die at the other end of the shank. The retainer in one embodiment is a riveted head on the shank. In another embodiment the retainer is a threaded head on the shank. In another embodiment the retainer includes a threaded plug on the shank. A further embodiment includes a vehicle bumper having a bracket bolted to a frame bracket by an energy absorbing fastener.

3,715,138
RESILIENT FRANGIBLE BUMPER GUARD
Milton Finkle, 2724 Vandiver Street, West Palm Beach, Fla.
Filed Jan. 22, 1971, Ser. No. 108,833
Int. Cl. B60r *19/08*; B61f *19/04*; E04f *19/00*
U.S. Cl. 293—1 **7 Claims**



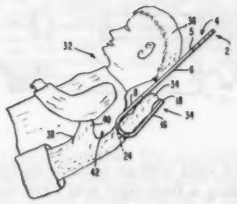
A resilient, flexible breakaway bumper guard for breakaway attachment to a vehicle bumper. The resilient guard is mounted on the bumper with an adhesive that allows for the breaking away of the guard upon a sizable collision, thus reducing or eliminating damage to the bumper. The adhesive may also hold air in a trapped space between the bumper and the resilient member providing additional resiliency prior to break-away.

3,715,139
SHOCK ABSORBING BUMPER
Robert E. Tuggle, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 12, 1971, Ser. No. 171,238
Int. Cl. B60r *19/02*; B61f *19/04*; F16f *9/30*
U.S. Cl. 293—70 **4 Claims**



An energy absorbing support unit adapted to mount a bumper bar on a vehicle frame for bodily movement through a predetermined stroke in response to impacts thereon, the support unit including a mounting tube rigidly affixed to the frame, a support tube of length substantially exceeding the bumper stroke and telescopically supported on the mounting tube, a pressure chamber of length generally equal to the bumper stroke filled with a combined damping and spring return medium and rigidly attached to the support tube, and an orificed piston and piston rod assembly slidably supported on the pressure chamber and connected to the mounting tube. Under impact, the pressure chamber and support tube are forced rearward relative to the piston and rod so that the damping and return medium is extruded through the piston for damping and compressed by the rod for effecting restoration of the support tube after impact.

3,715,140
INFANT HEAD SUPPORT
Steven Arnold Seiden, 1120 Park Ave., New York, N.Y. 10028
Filed Jan. 21, 1972, Ser. No. 219,768
Int. Cl. B65g *7/12*
U.S. Cl. 294—25 **7 Claims**

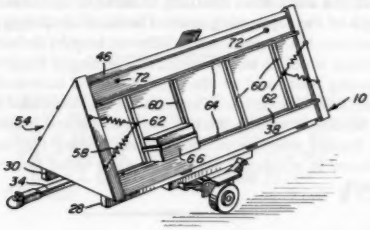


A hand-held device for supporting the head of an infant being held. The support device comprises a head support plate having a top and bottom surface and a handle connected to one edge of the support plate. The handle consists of a top portion, a central portion and a bottom portion. The top portion of the handle is connected at one end thereof to the support plate and at the other end to the central portion of the handle which extends downwardly from the top portion of the handle and away from

the bottom surface of the support plate. The central portion of the handle is connected to a bottom portion of the handle which extends under the top portion of the handle and towards the bottom surface of the support plate. The central portion has a centrally located aperture for the insertion of fingers of the user between the lower portion of the handle and the top portion of the handle and support plate.

In a preferred embodiment, the free end of the bottom portion of the handle is resiliently biased upwards towards the bottom surface of the support plate. The support is formed integrally of a thermoplastic sheet.

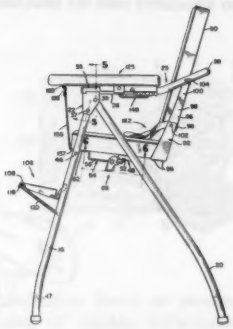
3,715,141
CONVERTIBLE TRAILER CONSTRUCTION
John W. Cary, Route 2, Kimberly, Idaho
Filed Jan. 5, 1971, Ser. No. 103,977
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 R **7 Claims**



A trailer body construction for disposition upon a trailer chassis. The body construction includes a center elongated longitudinally extending horizontal flooring section secured to the associated chassis in generally transverse centered position thereon as well as a pair of elongated longitudinally extending opposite side sections pivotally secured along one pair of longitudinal edge portions to the corresponding side edge portions of the center section for swinging between horizontal positions forming side extensions of said center section and upwardly convergent positions with their free edge portions disposed at least closely adjacent each other. The body construction includes both triangular opposite end wall sections for closing the opposite ends of the body construction when the side sections are swung to upwardly convergent positions and generally rectangular end wall sections for securement between corresponding ends of the side wall sections when the latter are disposed in generally parallel upstanding relation. Also, the center section is provided with structure for supporting the bows of a camping tent and the side sections include outer corner jack assemblies for supporting the side sections in substantially coplanar relation with the center section when the trailer body construction is being utilized as the base of a camping trailer.

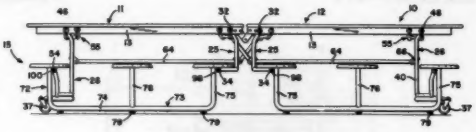
3,715,142
FOLDING HIGH CHAIR
Ralph B. Lay, and Ogden R. Olsen, both of Columbus, Ind., assignors to Hamilton Cosco, Inc., Columbus, Ind.
Filed June 10, 1971, Ser. No. 151,644
Int. Cl. A47c *4/18*
U.S. Cl. 297—39 **5 Claims**

A folding high chair in which the front and rear legs are swingably interconnected to each other and to a tray support. The seat is swingably connected to the front legs on a fixed axis and to the rear legs on a sliding axis, and the back rest is swingably connected to said seat and tray support. The front and rear legs are releasably locked in an extended diverging



position with the seat and back rest generally normal to each other by a locking assembly carried from the seat.

3,715,143
FOLDING TABLE AND SEAT SUPPORT STRUCTURE
Carl F. Gerken, New Castle, and Emmett R. Bales, New Manchester, both of Ind., assignors to American Standard Inc., New York, N.Y.
Filed Feb. 2, 1971, Ser. No. 111,863
Int. Cl. A47b *3/14*
U.S. Cl. 297—159 **1 Claim**

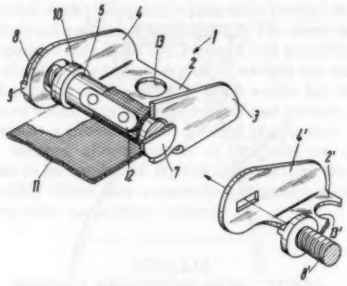


A folding table has a support structure including inner end frames and outer end frames pivotally secured near the inner and outer ends of a pair of table tops hinged together at their respective inner ends. The inner end frames are suspended above the floor, while the outer end frames carry casters for engaging the floor during folding and while folded, and both sets of frames include elbows or end portions which extend laterally outwardly from both sides of the table tops. Seating structures are pivotally mounted on each side of each table top on the lateral end portions of the inner end outer frames on corresponding sides of the table tops. Each seating structure includes a unitary member which provides longitudinal seating strength and has means for pivotally receiving the respective end portions at the inner end and outer end of the table tops. The unitary members preferably engage the floor only when the table is in the operative position, providing a total supporting function, but lift off the floor when the table is moved toward the folded position when the casters engage the floor and provide the total supporting function.

3,715,144
SAFETY BELT CONSTRUCTION
Horst Minolla, Norderstedt, Germany, assignor to Klippan GmbH, Nordestedt, Germany
Filed Sept. 16, 1970, Ser. No. 72,773
Claims priority, application Germany, Sept. 19, 1969, P 19 47 438.5
Int. Cl. A62b *35/60*
U.S. Cl. 297—386 **3 Claims**

A safety belt has an end portion and a housing mounts a structural element which is at least in part rotatable with con-

comitant displacement longitudinally of its axis of rotation. Deformable means, for instance a ring confined between portions of the housing and an axial end of the structural element, is provided and so associated with the structural element that



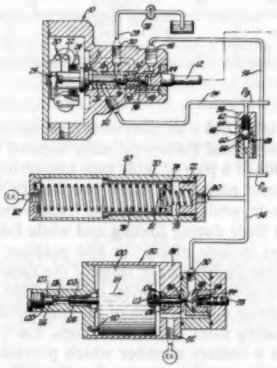
it is deformed by the same when the structural element is displaced longitudinally of its axis of rotation in response to the pull upon the safety belt section exceeding a predetermined level of force.

3,715,145

HYDRAULIC ANTI-LOCK BRAKE CONTROL SYSTEM

John L. Harned, Grosse Pointe Woods, and Edwin E. Stewart, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 30, 1971, Ser. No. 185,304
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 F **3 Claims**



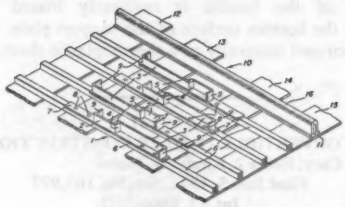
The invention utilizes a wheel speed proportional pressure generated by a transmission governor and a vehicle ground speed pressure provided by a vehicle ground speed computer and provides a hydraulic anti-lock brake system including a fluid pressure operated wheel brake, an operator actuated master cylinder, a low speed cutout valve which communicates the master cylinder pressure directly to the wheel brake at vehicle speeds below some predetermined level, a control valve which modulates the governor pressure to provide a control pressure proportional to the amount by which master cylinder pressure exceeds the brake pressure and a clutch modulator which acts at vehicle speeds above the threshold of the low speed cutout valve to provide a brake pressure proportional to the control pressure. The transmission governor is modified to receive the vehicle ground speed pressure and apply a force proportional thereto to the governor valve spool so that during wheel slip the governor pressure is a function of both wheel speed and ground speed, or, in other words, a function of the magnitude of wheel slip.

3,715,146

SNOW CLEAT AND TRACK FOR TRACKED VEHICLE

William Lauchlin Robertson, 7024 Kenosie Place, Calgary, Alberta, Canada

Filed Jan. 15, 1971, Ser. No. 106,668
Claims priority, application Canada, Jan. 19, 1970, 072495
Int. Cl. B62d *55/28*
U.S. Cl. 305—35 EB **21 Claims**



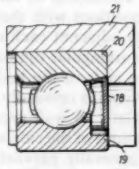
A snow cleat and a track particularly adapted for use in deep snow. A track wherein snow cleats are arranged to provide greater spacings longitudinally of the track adjacent each edge of the track than centrally thereof to increase the shear strength of the supporting snow. The snow cleat may comprise two traction blade portions of different lengths defining a traction blade which is unsymmetrically arranged lengthwise of a supporting base, and an ice cleat mounted intermediate said traction blade portions. The snow track may also comprise snow blades extending the full width of the track and separating a limited number of snow cleats having traction blades positioned in staggered relation to each other transversely of the track.

3,715,147

SEALING RING ARRANGEMENT FOR ANTI-FRICTION BEARINGS

Gunter Zahn, Dusseldorf, Germany, assignor to Ziller & Co., Dusseldorf, Germany

Division of Ser. No. 781,814, Dec. 6, 1968, Pat. No. 3,586,404. This application Sept. 2, 1970, Ser. No. 69,052
Claims priority, application Germany, Dec. 14, 1967, P 16 25 661.4
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.2 **2 Claims**



A sealing ring and mounting thereof for an anti-friction bearing, which has a sealing edge for resiliently engaging one end face of one race ring of an anti-friction bearing and also has a conically shaped arm for engagement with a conical surface on either the other ring of the anti-friction bearing or a conical surface of a housing or a shaft.

3,715,148

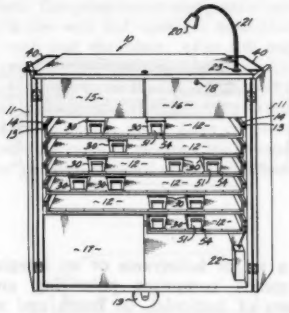
MEDICINE DISPENSING CABINET

Clifford L. Beals, 326 N. Riverside Ave., Rialto, Calif. 92310

Filed June 3, 1971, Ser. No. 149,731
Int. Cl. A47b *81/00, 91/00*
U.S. Cl. 312—209 **1 Claim**

This invention discloses a medicine dispensing cabinet which provides an efficient method of dispensing medicine to patients in a hospital or a convalescent home. The

device discloses a cabinet having a plurality of sliding drawers, a plurality of dispensing trays, each tray having



a transparent, spring-biased lid, and a resilient clip-handle for carrying identification information.

3,715,149

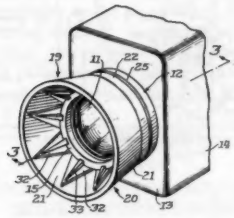
CONVERTIBLE SUNSHADE AND LENS CAP

Stanley R. Freeland, Glenview, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Apr. 16, 1971, Ser. No. 134,795

Int. Cl. G02b *23/16*; G03b *11/04*

U.S. Cl. 350—58 **2 Claims**



A convertible sunshade and lens cap device adapted for protecting a lens in a lens mount of an optical instrument respectively from light rays of extreme angles during use and from dust during storage. The device comprises a tubular sunshade adjustable to cause hinged, preferably integral, flap portions to pivot between open and closed orientations.

3,715,150

PHOTOCHROMIC FIBER OPTIC PLATE

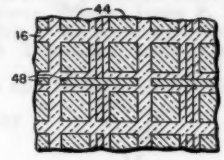
Roy E. Love and Ralph A. Westwig, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 14, 1971, Ser. No. 180,364

Int. Cl. G02b *5/16*

U.S. Cl. 350—96 B **12 Claims**

Disclosed is an optical image storage system of the type utilizing a photochromic fiber optic image storage plate and an apparatus for rapidly bleaching information stored in the storage plate. In addition to the usual multiplicity of optical fibers containing photochromic material, the image storage plate also comprises a plurality of conductive fibers disposed parallel to the optical fibers. Means such as an induction coil disposed around the image storage plate or transparent electroconductive electrodes disposed on opposite faces of the image storage plate are provided for causing current



flow in the conductive fibers to generate heat therein, thereby bleaching or erasing information contained in the image storage plate.

3,715,151

PANCRATIC LENS

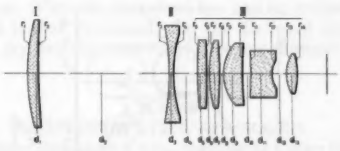
Trude Muszumanski, and Irmgard Wendisch, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Sept. 8, 1970, Ser. No. 69,810

Claims priority, application Austria, Sept. 26, 1969, A 9165/69

Int. Cl. G02b *15/14*

U.S. Cl. 350—184 **2 Claims**



A positive, meniscus-shaped front lens unit has a convex front surface and a concave rear surface. The concave surface has a radius of curvature which is more than twice and less than ten times the radius of curvature of said convex surface. A single biconcave lens element is axially slidably mounted between said front lens unit and a positive rear main lens unit. The radius of curvature of the front surface of said biconcave lens element is more than twice and less than three times the radius of curvature of the rear surface of the bi-concave lens element. The biconcave lens element has an index of refraction n_{d3} and an Abbe number v_{d3} meeting the following conditions:

$$n_{d3} \leq 1.63$$

$$v_{d3} \leq 47$$

3,715,152

MULTIPLE-PASS REIMAGING OPTICAL SYSTEM

William D. Gunter, Jr., 5290 Dellwood Way, San Jose, Calif. 95118, and Richard M. Brown, 280 Easy St., Apt. 6E, Mountain View, Calif. 94040

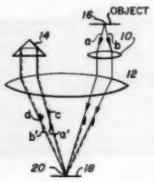
Filed Jan. 19, 1971, Ser. No. 107,659

Int. Cl. G02b *17/08*

U.S. Cl. 350—202 **14 Claims**

An optical imaging system for enabling nonabsorbed light imaged onto a photodetective surface to be collected

and reimaged one or more times onto that surface in register with the original image. The system includes an objective lens, one or more imaging lenses, one or more retroreflectors and perhaps a prism for providing optical matching of the imaging lens focal planes to the photodetective surface.

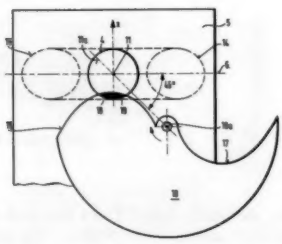


3,715,153

SINGLE-WING LIGHT CHOPPER FOR INFRARED GAS ANALYZERS

Gunter Schunck, Karlsruhe, Winfried Speeter, Herxheim, and Albert Randow, Karlsruhe, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 26, 1971, Ser. No. 192,103
Claims priority, application Germany, Oct. 27, 1970, P 20 52 609.4
Int. Cl. G02f *1/30*; G01n *21/24*; G01d *5/36*
U.S. Cl. 350—273 6 Claims



Between a light source and the inlet opening of a beam splitter of the type associated with an infrared gas analyzer there is disposed a single-wing rotary shutter provided with a sole blocking edge and a sole opening edge and is driven by a commutatorless D.C. motor. The axis of rotation of the shutter is arranged parallel with the symmetry axis of the beam splitter and spaced from the symmetry plane thereof.

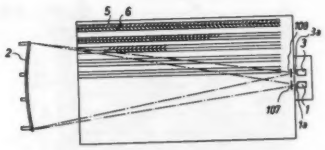
3,715,154

THREE-DIMENSIONAL PICTURE PROJECTION

Friedrich Bestenreiner, Grunwald, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 9, 1971, Ser. No. 122,449
Claims priority, application Germany, Mar. 11, 1970, P 20 11 417.4
Int. Cl. G03b *35/20*
U.S. Cl. 352—61 14 Claims

A projection screen for use in three-dimensional projection systems wherein two discrete projectors project spaced apart images of a scene to be viewed has a flat arrangement of discrete records of first and second viewing zones from which the screen is to be viewed by the right and left eyes of persons in the audience. The impingement of images from the first and second projectors is respectively confined onto the records of the first and second viewing zones. The arrangement of records is a set of holograms or an integram and the confining means comprises polarizing and/or color filters, rasters of lenticules, or lasers and a set of adjustable mirrors.

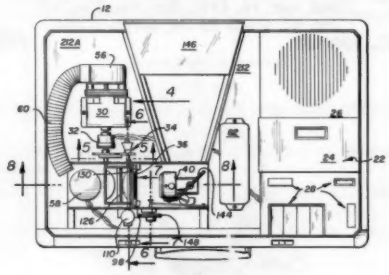


3,715,155

AUDIO-VISUAL DISPLAY DEVICE

Walter Daniel Grupp, Boulder, Colo., assignor to Elba Corporation, Denver, Colo.

Filed Aug. 30, 1968, Ser. No. 756,609
Int. Cl. G03b *31/00, 3/00, 21/28*
U.S. Cl. 353—15 5 Claims



A portable audio-visual display device characterized by a compact film cartridge employing conventional 35 mm. still camera film strip, the frames being sequentially power advanced by a signal received from an audio unit and the take-up spool also being synchronously power driven in such manner to compensate for the increase in diameter of the film convolutions on the take-up spool. Manual override of the power drive is provided for framing with a film gate or manual advance of the frames. Power operated film advance features an escapement drive which is initiated by a short duration signal received from the audio unit and a holding circuit which maintains it in operation until the film has been advanced one frame.

3,715,156

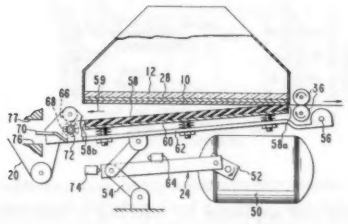
IMAGING DEVICE HAVING A PIVOTING PRESSURE PAD FOR ENGAGING AND DISENGAGING A WEB MEDIUM

Raymond L. Levy, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed March 22, 1971, Ser. No. 126,779
Int. Cl. G03g *15/00*
U.S. Cl. 355—16 8 Claims

The recording web in an electrophotographic apparatus is pressed into engagement with the photoconductive plate by a

flexible, resilient, pivoting pressure pad. Due to the positioning of the axis of the pressure pad with respect to the plane of the photoconductive plate, the end of the pressure pad closest to the pivot axis initially contact the web. The area of engagement then increases as the pressure pad is further pivoted against the plate. This progressive engagement action smooths out wrinkles in the web and squeeges or displaces air from between the web and the plate. After full engagement is established, an exposure-imaging cycle is initiated which causes a charge image to be formed on the web. The charge image establishes electrostatic forces which further engage the web to the photoconductive plate. After exposure, the web is disengaged from the plate by pivoting the pressure pad away from the plate. The web is peeled off of the surface of the plate



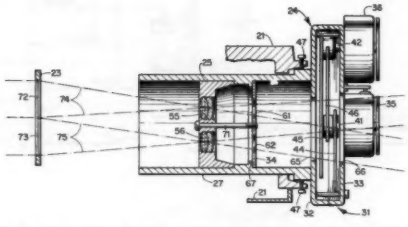
during this disengagement causing the area of engagement to progressively decrease as the pressure pad is pivoted. The pivoting-peeling action requires less disengagement force to overcome the electrostatic engagement force than would be required if the web were disengaged over the entire area of engagement simultaneously. Further minimization of the disengagement force is obtained because the force of disengagement established by the pivoting pressure pad is applied generally perpendicular to the plane of the web-plate engagement. The present minimal disengagement forces remain uniformly minimal throughout the disengagement cycle. Timers and limit switches are employed to automate the pressure pad pivoting, exposure-charge cycle, and web transport cycle.

3,715,157

PROJECTION APPARATUS FOR MULTIPLE-SECTOR SLIDE TRANSPARENCIES

Harvey R. Worthington, Jr., Cambridge, Mass., assignor to Searle Medidata Inc., Waltham, Mass.

Filed Nov. 19, 1969, Ser. No. 878,025
Int. Cl. G03b *21/26, 21/14*
U.S. Cl. 353—25 **9 Claims**



Apparatus for selectively projecting images of one or more sectors of a multiple sector slide transparency. The apparatus, with its various embodiments, is operative to select any single sector of a particular slide for projection onto a screen and its further operative to superimpose the image of one sector of a slide upon the image of another sector of the same slide.

ERRATUM

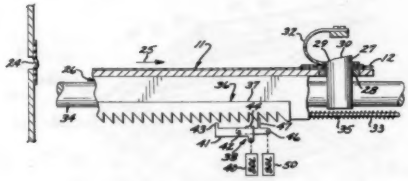
For Class 355—16 see:
Patent No. 3,715,156

3,715,158

MICROFICHE CAMERA PROCESSOR

Clyde E. Le Fevre, Orange, James P. Hagan, Laguna Beach, and Ben H. Owens, Orange, Calif., assignors to Micrographic Technology Corporation, Santa Ana, Calif.

Filed Apr. 19, 1971, Ser. No. 135,180
Int. Cl. G03c *27/52*
U.S. Cl. 355—27 **5 Claims**



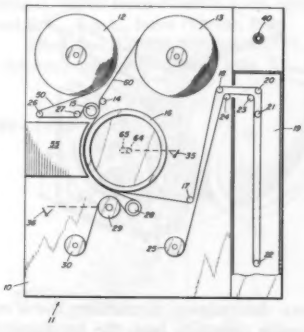
Apparatus for producing a microfiche using a single sheet film pack of photographic film; the film pack comprising a protective cover to prevent exposure of the film sheet to ambient light so that the film pack may therefore be handled without fear of premature exposure. The film pack is inserted into a dark chamber of the disclosed apparatus; and the protective cover is then removed. The photographic film sheet is now optically exposed to produce reduced size images of data to be recorded; an indexing arrangement being used to remove the film sheet to various locations in accordance with the desired microfiche format. When the film sheet has had its various areas exposed, it is then processed; and the disclosed apparatus delivers a dry finished microfiche in a few moments.

3,715,159

FILM DUPLICATING APPARATUS

Walter Allport, Stamford, Conn., assignor to Cutler Hammer, Inc., Milwaukee, Wis.

Filed Nov. 24, 1971, Ser. No. 201,643
Int. Cl. G03b *27/10*
U.S. Cl. 355—110 **7 Claims**



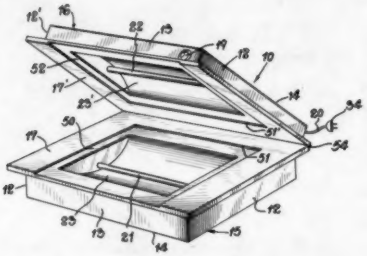
An apparatus for duplicating photographic film of the type wherein original and copy film travel together over a printing drum and are irradiated by exposing light in a printing zone. A combination of rollers act to isolate the films in the printing zone so that film tensions outside the zone are not particularly critical. The surface of the drum is of a relatively low friction material so that the films are free to slip somewhat on the

drum as is necessary to prevent relative movement as between original and copy films.

3,715,160
COPYING AND PHOTOGRAPHIC CONTACT PRINTING MACHINES

Seymour J. Fader, 377 McKinley Boulevard, Paramus, N.J.

Continuation-in-part of Ser. No. 121,385, March 5, 1971, abandoned. This application June 21, 1971, Ser. No. 155,075
Int. Cl. G03b 27/04
U.S. Cl. 355—113 6 Claims



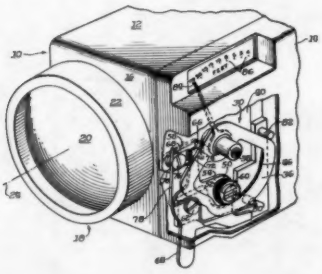
A combination copying machine and photographic contact printer having two light stations; for copy making one is used for exposing the sensitive sheet material through the original and the other is used for developing the sensitive sheet material. For photographic contact print-making one or both of the stations are used as required by the photographic transparency from which the print is to be made, the type of reproduction and the reproduction material.

A photographic contact printer having a light station. The sensitive sheet material is exposed through the negative and the light is used for exposing-developing the sensitive sheet material.

3,715,161
LENS FOCUSING MECHANISM WITH MANUAL CONTROL

Henry J. Koeber, Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 28, 1971, Ser. No. 147,943
Int. Cl. G03b 3/00
U.S. Cl. 356—3 12 Claims

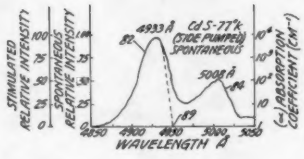


A distance determining mechanism for a camera having a focusable objective lens, the mechanism including a pendulous member having a cam surface formed with fine pitched teeth with which similar teeth on a cam follower cooperate to cause adjustment of the lens to a focus condition and, after adjustment, to cause substantially positive locking of the lens in adjusted position while enabling manual focusing through actuation of an externally extending focusing control.

3,715,162
FREE EXCITON INDIRECT TRANSITION LASER

Donald A. Campbell; James R. Packard, both of St. Paul; William C. Tait, Oak Park, all of Minn., and Richard L. Weiher, Hudson Township, St. Croix County, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 803,805, March 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 715,799, March 25, 1965, abandoned. This application April 19, 1971, Ser. No. 135,369
Int. Cl. G03b 27/52
U.S. Cl. 356—30 5 Claims

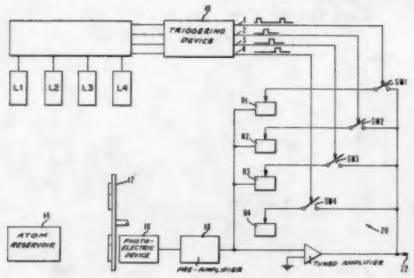


A method and apparatus for selecting a direct band gap semiconductor crystal for use as a room temperature operable laser material. The crystal is selected when its emission spectrum is characterized by a series of peaks separated in energy by the energy of one longitudinal optical phonon and when the zero intensity extrapolation point on the low energy side of the highest energy peak of the series is below the lowest energy exciton peak of its reflection spectrum by an amount equal to the energy of one longitudinal optical phonon. The emission and reflection spectra are produced at 77°K.

3,715,163
APPARATUS FOR SIMULTANEOUS MULTIELEMENT ANALYSIS BY ATOMIC FLUORESCENCE SPECTROSCOPY

Douglas Mitchell, Tarrytown, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 21, 1970, Ser. No. 65,822
Claims priority, application Great Britain, Oct. 25, 1969, 42,300/69
Int. Cl. G01j 3/34; G01n 21/52
U.S. Cl. 356—85 10 Claims



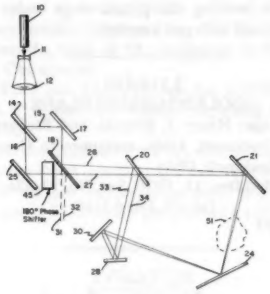
Apparatus for processing a plurality of successive electrical signals of varying magnitudes comprises an amplifier arrangement whose gain is varied in phase with the signal being then received, whereby the output is maintained within a predetermined range the amplifier arrangement is operated under its optimum load conditions. The amplifier arrangement is designed in junction with spectroscopic apparatus for effecting simultaneous multielement analysis.

3,715,164

FOUR BEAM HOLOGRAPHIC INTERFEROMETRY

Lee O. Heflinger, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 1, 1971, Ser. No. 194,425
Int. Cl. G01b 9/02; G02b
U.S. Cl. 356—109 5 Claims



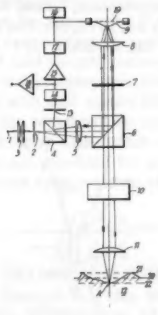
A double-exposure holographic interferometric system for visualizing small disturbances of a subject. The system utilizes two reference beams and two subject beams cast simultaneously on a recording medium in such a way that the two subject beams and the two reference beams each form a small angle with each other. For the second exposure one of the subject beams and one of the reference beams is shifted in phase by 180° with respect to its associated beam. This will create a regular holographic grating which is phase modulated by the disturbances or perturbations of the subject. Upon proper reconstruction of the hologram the phase modulations will cause brightenings of the normally dark background of the reconstructed hologram. The system has the advantage that it is relatively insensitive to errors of phase shift or to variations of the light intensity between the two exposures.

3,715,165

INVESTIGATING THE TOPOGRAPHY OF REFLECTING SURFACES

Francis Hughes Smith, York, England, assignor to Vickers Limited, Millbank, London, England

Filed June 7, 1971, Ser. No. 150,655
Claims priority, application Great Britain, June 9, 1970, 27,976/70
Int. Cl. G01b 11/30, 11/00
U.S. Cl. 356—120 20 Claims



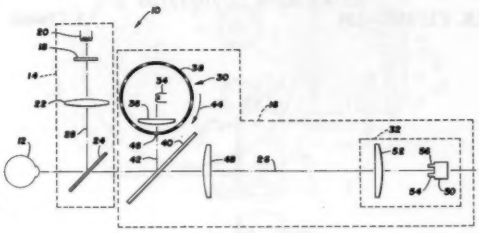
A specimen surface is investigated with an optical arrangement that brings a pencil of light to a point focus which oscillates longitudinally about the surface. In dependence upon light reflected from the surface, photoelectronic means provide an electrical signal controlling displacement of a reflecting surface of the arrangement to bring the mean position about which the focus oscillates towards coincidence with the surface.

3,715,166

APPARATUS FOR LOCATING A VARIABLE OPTICAL FOCAL POINT

Clifford A. Leighty, West Chester, Ohio; Joseph J. Sliwkowski, Framingham, Mass., and Bernard J. Sullivan, Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 18, 1971, Ser. No. 116,505
Int. Cl. G01b 9/00; A61b 3/10
U.S. Cl. 356—125 19 Claims



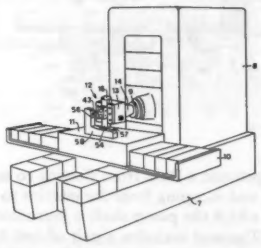
An apparatus employing a servo system locates the focal point of a scanned beam of light where the scanning beam has a conical locus as in an electronic retinoscope. A pair of photodetectors are spaced apart in the direction of scan and are disposed upon a movable trolley. When the beam is swept across the photodetectors, generally sinusoidal signals are generated which have a phase relationship indicative of the direction of scan of the beam across the photodetectors and, therefore, to the position of the trolley relative to the focal point of the beam. The generated signals are amplified and their peaks or zero crossings are detected to trigger two flip-flop circuit output signals which are phase compared to provide a drive signal to a servo system which through mechanical means drives the trolley toward the focal point. When the trolley is disposed at the focal point, the photodetectors are scanned simultaneously thereby giving no phase difference and, accordingly, no drive signal is generated.

3,715,167

CONTROL DEVICE FOR A BORING TOOL HOLDER OF MACHINE TOOLS

Giorgio Ollearo, 10015 Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

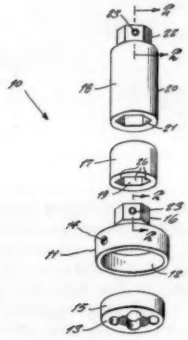
Filed June 2, 1970, Ser. No. 42,727
Claims priority, application Italy, June 21, 1969, 52333 A/69
Int. Cl. B23b 29/034
U.S. Cl. 408—149 8 Claims



In a machine tool comprising a spindle and means to align the spindle in a predetermined angular position about its own

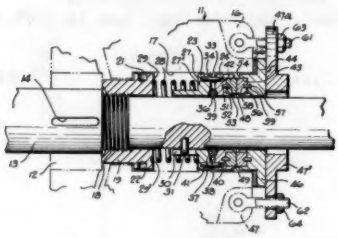
axis, a tool holder is adapted to be fixed to the spindle, the toolholder comprises a body engageable with the spindle and a slide radially shiftable on said body, and normally locked on said body. A single member fixed to the worktable carries two abutments at 90° to one another with one abutment parallel to said slide when said spindle is aligned, each other in two directions parallel to said abutments respectively and cooperating with said slide to unlock it and to produce a radial shifting of the slide on said body.

3,715,168
DIE STOCK (HOLDER) AND EXTENSION
Russell P. Kuhn, 109 Tesing Circle, Bridgeport, Conn. 06606
Filed Feb. 9, 1971, Ser. No. 113,903
Int. Cl. B23b *31/10, 13/06*
U.S. Cl. 408—239 **3 Claims**



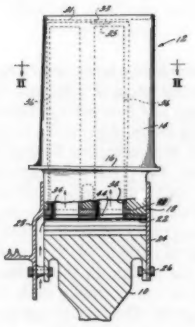
A die stock holder and extension set which includes a separate die stock for supporting a thread cutting die, the die stock being engageable either directly to a socket wrench or to an elongated extension which in turn is engaged to the socket wrench.

3,715,169
SPRING-LIQUAMATIC PRESS O-RING PLASTIC ROTO SEAL FOR ROTARY PUMP SHAFTS
John Molis, P.O. Box 3915, Station A, Baytown, Tex.
Filed Sept. 1, 1971, Ser. No. 176,915
Int. Cl. F01d *11/08*
U.S. Cl. 415—170 **6 Claims**



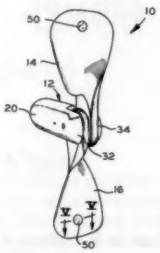
A shaft seal to prevent a fluid from flowing to and along a rotary pump shaft and escaping from the interior to the exterior of a housing in which the pump shaft is journaled and from which it extends. The seal includes a pair of end bushings of which one is directly connected to the shaft and the other end bushing is mounted on the housing, and a pair of intermediate pin-connected bushings slip-fitted upon the shaft with a compression spring urging the intermediate bushings toward one another and maintaining an elastomer ring under compression therebetween to seal off flow of fluid around the shaft and between such pin-connected intermediate bushings, and a pair of opposed resilient plastic rings pin-mounted and connected on one of the intermediate bushings and the end bushing on the housing to seal off flow of fluid therebetween and from around the shaft, and a strong-back detachably mounted on the housing for holding the plastic-rings under pressure in sealing engagement with one another.

3,715,170
COOLED TURBINE BLADE
Joseph W. Savage; Henry J. Brands, and Richard H. Anderson, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Dec. 11, 1970, Ser. No. 97,226
Int. Cl. F01d *5/18*
U.S. Cl. 416—97 **8 Claims**



An air-cooled turbine blade has a circular arc mounting tang generally aligned with a cambered airfoil portion. The latter is of thin-walled construction, including an integral tip wall, defining an internal cavity. A pair of inserts are inserted through radial passageways on the tang to project into this cavity. Cooling air passes to the inserts and is discharged therefrom through a multiplicity of holes to impinge the cavity walls and enhance the convection cooling thereof.

3,715,171
FOLDABLE PROPELLER
Robert E. Kettner, East Grand Rapids, Mich., assignor to Michigan Wheel Corporation, Grand Rapids, Mich.
Filed May 14, 1971, Ser. No. 143,510
Int. Cl. B63h *1/24*
U.S. Cl. 416—142 **10 Claims**



A propeller for a powered boat wherein the blades of the propeller are open through centrifugal force to propel the

boat and are closed when the boat is not being powered so as to reduce drag on the boat. The blades are maintained in the closed position by operation of ceramic magnets disposed adjacent the tips of the blades.

3,715,172
UREA- AND MELAMINE- FORMALDEHYDE BRIDGING AGENTS

Ronald J. Dembowski, Calumet City, and Theodore R. Schuh, North Riverside, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Jan. 12, 1971, Ser. No. 105,987
Int. Cl. C08c *9/16*; **C08d** *9/10*; **C08g** *37/32*
U.S. Cl. 260—3 **4 Claims**

Method and composition for a dry mix utilizing a natural or synthetic rubber stock containing a non-reinforcing filler and about 0,1 to 10 phr of an aminoplast polymer optimally modified by about 5–20 molar per cent of a polyamine.

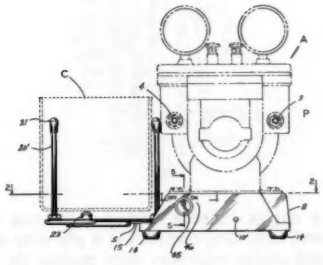
ERRATUM

For Class 416—198 see:
Patent No. 3,715,176

3,715,173
PUMP CONTROLLER

Herbert F. Froeschner, 5606 Lucas and Hunt Road, St. Louis, Mo.

Filed March 9, 1971, Ser. No. 122,438
Int. Cl. F04b *49/00*
U.S. Cl. 417—37 **8 Claims**



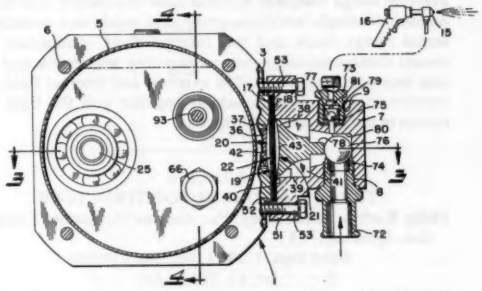
A controller for pumps used in the dispensing of liquids to a vessel for effecting discontinuance of pump operation when the vessel has received a predetermined volume of liquid comprising a pivoted arm for supporting the vessel to be filled, a pump switch having cooperating components, said arm carrying a component of said switch, means urging said arm upwardly for normally maintaining said switch in closed, pump-operating condition with said means being overcome by the combined weight of the vessel and the received predetermined volume of liquid whereby said switch will be automatically opened. Cam means are provided for preventing switch-closing swinging of said arm upon removal of the liquid-containing vessel.

3,715,174
DIAPHRAGM PUMP

Howard C. Davis; Howard B. Pritz, both of Columbus, and Charles A. Burton, Worthington, all of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Aug. 31, 1970, Ser. No. 68,120
Int. Cl. F04b *49/08*, *43/06*
U.S. Cl. 417—311 **15 Claims**

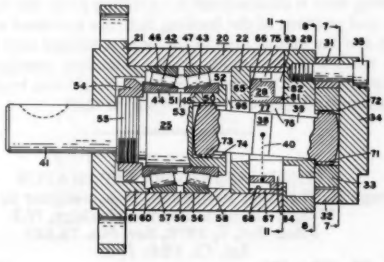
A diaphragm pump including a variable area relief valve for the working fluid which permits the pump to operate at reduced pressure when a peak load is reached during standby operation to reduce power requirements, allow the pump to run cooler, and reduce wear of parts. The walls of the pumping and working chambers are desirably shaped to conform to the natural form taken by the diaphragm during flexing for increased diaphragm life, and relatively small ring-shaped flow passages of different diameters desirably communicate with such chambers to reduce the change of diaphragm extrusion into the flow passages and diaphragm rupture. The diaphragm itself may consist of multiple unconnected layers all of the same size for increased life, and radially spaced cooperating seal ridges may be provided on the diaphragm clamping faces to prevent extrusion of the diaphragm material into the center during uniform clamping of the diaphragm around its periphery. A molded diaphragm having a built-up center portion may also be used for increased life.



3,715,175
ROTARY VALVE COMPONENT MEANS

George V. Woodling, 22077 West Lake Road, Rocky River, Ohio

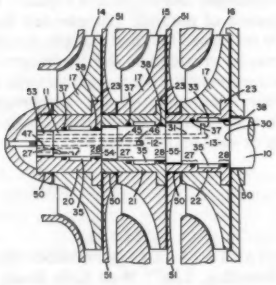
Continuation of Ser. No. 887,614, Dec. 23, 1969, Pat. No. 3,591,321, which is a continuation of Ser. No. 637,382, May 10, 1967, Pat. No. 3,405,603. This application Feb. 24, 1971, Ser. No. 118,312
Int. Cl. F01c *1/02*; **F03c** *3/00*; **F04c** *1/02*
U.S. Cl. 418—61 **9 Claims**



Rotary valve component means having a rotary valve face disposed to sealingly engage face wall valve means having communicating fluid port means therein to control the flow of fluid to and from fluid pressure operating means. The rotary

valve component means is reversible in operation and has a hollow annular valve body for retaining fluid externally therearound and for retaining fluid internally therewithin to provide for said reversible operation. The hollow annular valve body has a valve end portion comprising an external flange body extending outwardly therefrom and an internal flange body extending inwardly therefrom. The external and internal flange bodies respectively have inside and outside flange faces. The rotary valve face includes the outside flange faces. The inside flange faces constitute fluid retaining faces to blank flow of fluid to and from said face wall valve means. The external flange body has external fluid conduction wall means communicatingly interconnecting said inside and outside external flange faces and has internal fluid conduction wall means communicatingly interconnecting said inside and outside internal flange faces. The external and internal fluid conduction means communicatingly register with the fluid port means in the face wall valve means.

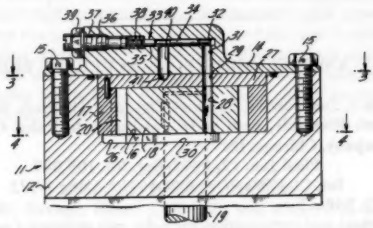
3,715,176
TURBO MACHINE ROTOR STRUCTURE
Philip Kerklo, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Sept. 1, 1971, Ser. No. 176,896
Int. Cl. F01d *5/06*
U.S. Cl. 416—198 **3 Claims**



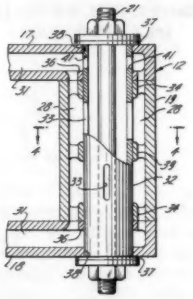
The wheel shaft of a multi-stage turbo machine is formed with a succession of adjoining areas which progressively change in diameter to provide a stepped shaft arrangement. The bores in all of the wheels are the same diameter. A bushing is fixed in the bore of each wheel. The bore in each bushing has an end portion dimensioned for an interference fit with a selected area on the shaft. The opposite end portion of the bushing bore is dimensioned for a sliding fit on the shaft area. The end portions of the bushing bore are provided with shaft seals and the medial area of the bore is formed with a recess. The shaft is formed with axially extending passages which communicate with the recesses in the respective bushings for expansion and removal thereof from the shaft.

3,715,177
FLUID METERING APPARATUS
George H. Woodier, Ringwood, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed Oct. 7, 1970, Ser. No. 78,645
Int. Cl. F04c *1/06*
U.S. Cl. 418—171 **17 Claims**

A fluid metering apparatus comprising a plurality of rotary members supported in a housing and interconnected to rotate at different angular velocities. The rotary members and the housing having passageways located to come into registry with each other and with a source of pressurized liquid in the housing and a discharge port means in the housing once in every predetermined amount of angular movement of the faster rotating member to thereby periodically communicate the source of pressurized fluid with the discharge port means and flow liquid through the latter.



3,715,178
DOWELING CONSTRUCTION FOR ROTARY ENGINE HOUSING
Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed Nov. 30, 1971, Ser. No. 203,279
Int. Cl. F01c *21/06*; F04c *29/04*; F02b *55/10*
U.S. Cl. 418—83 **5 Claims**

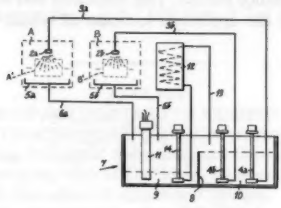


A rotary engine housing having a locating and positioning dowel structure, comprising a plurality of hollow, liquid cooled dowel members with coaxial tie bolts, the dowel members having their ends rigidly supported and being supported at other stress points generated by thermal movement and high pressure, in such a manner that deflections and distortions are obviated.

3,715,179
MOULDING APPARATUS
Aubrey Joseph Westbrook, Kilwinning, and Ian David MacKnight Thomson, Irvine, both of Scotland, assignors to Plastic Rotational Moulding Limited, London, England
Filed Nov. 19, 1970, Ser. No. 90,994
Claims priority, application Great Britain, Nov. 26, 1969, 57,829/69
Int. Cl. B28b *1/26*
U.S. Cl. 425—86 **5 Claims**

A rotational moulding apparatus comprises mould-support means, a heating chamber in which the mould-support means may be located, first and second tanks adapted to contain a liquid or liquifiable solid heating medium, first heating means for heating at least the contents of the first tank, a loop path for the heating medium leading from the first tank to a second heating means and back to the second tank, first pump means for causing heating medium to flow along the loop path, supply duct means from the second tank to spray means located in the heating chamber, return duct means leading to

the first tank from catchment means in the heating chamber disposed to collect heating medium flowing from the spray means, second pump means to move heating medium from the



second tank through the supply duct means to the heating chamber, and overflow means interconnecting the first and second tanks.

3,715,180

ELECTRONIC PROGRAMMER UNIT FOR BURNER CONTROL

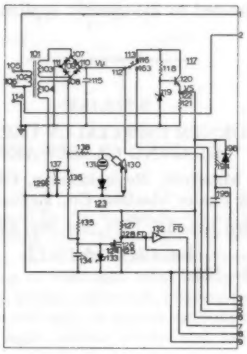
Edward Geoffrey Cordell, Somerset, England, assignor to Normalair-Garrett (Holdings) Limited, Somerset, England

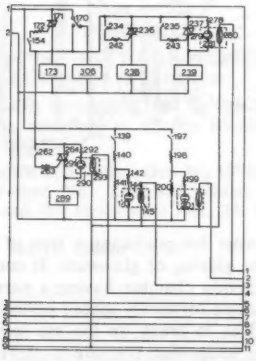
Filed Feb. 8, 1971, Ser. No. 113,407

Claims priority, application Great Britain, Feb. 9, 1970, 6,079/70

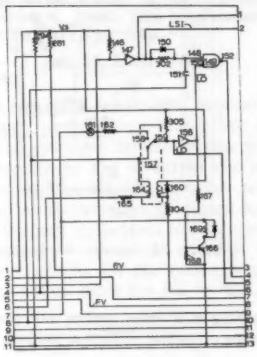
Int. Cl. F23n

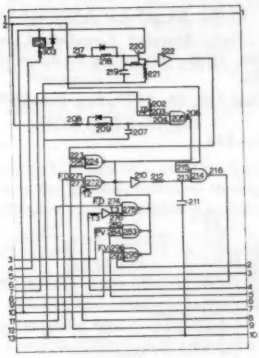
U.S. Cl. 431—25 **9 Claims**

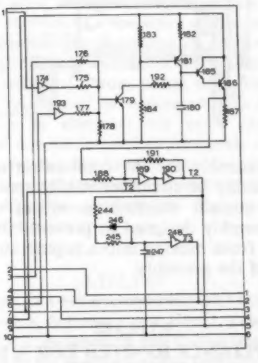




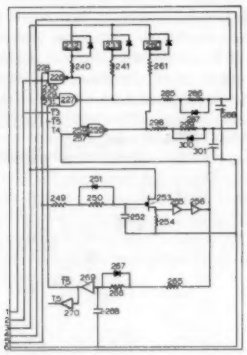
An electronic programme timer means of solid state construction, for a fuel burner, said programme timer means comprising a control switch for initiating operation, a plurality of sequencing relays, flame sensing means connected to voltage comparators, voltage ramp generator, voltage follower and level detectors with output connected to said comparators for







controlling said sequencing relays, feedback means to said comparators to ensure correct switching, temperature sensing



means for switching said timer means and pressure sensing means for checking operation of blower purging means.

3,715,181

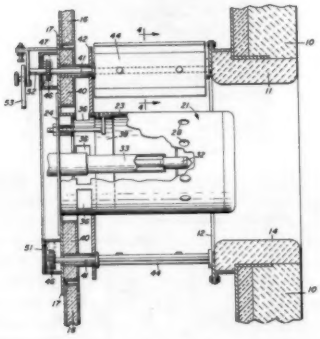
FUEL BURNER ASSEMBLY

John Smith Zink, Hershel Goodnight, and Robert D. Reed, Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jan. 26, 1971, Ser. No. 109,834

Int. Cl. F23m *9/00*

U.S. Cl. 431—184 **4 Claims**



A burner assembly for the combustion of liquid fuel wherein a plurality of circumferentially spaced vanes are adjustable to control whirling movement of secondary air and an assembly designed to prevent circumferentially moving air from moving into a regenerative tile which forms a part of the assembly.

3,715,182

GAS APPLIANCE IGNITER FOR A MOBILE LIVING UNIT

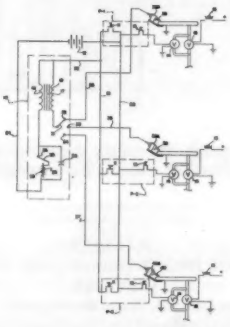
John C. Ward, 5335 NE. Irving, Portland, Oreg. 97213

Filed Oct. 18, 1971, Ser. No. 189,943

Int. Cl. F23q *3/00*

U.S. Cl. 431—264 **2 Claims**

An ignition system for gas burning appliances of a mobile living unit, such appliances including stoves, furnaces, propane refrigeration units and the like. Arc-initiating electrodes are located adjacent the burners of such appliances and are in circuit with the secondary winding of an induction coil for initiating an arc across to the grounded appliance burner. The induction coil is energized remotely from the appliance location at which location a



fuel by-pass control is conventionally located whereby the operator may effect simultaneous operation of the ignition system and fuel discharge from the burner. Pre-set selector means, in circuit with the coil, permits the output of the coil to be directed to the specific appliance burner being ignited.

3,715,183

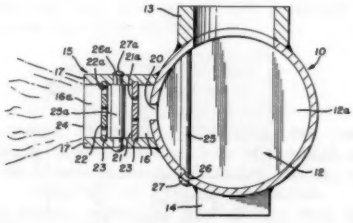
GAS BURNER ESPECIALLY USEFUL FOR GLAZING GLASSWARE

Richard W. Manifold, Reynoldsburg, Ohio, assignor to Manifold & Phalor Machine Co., Reynoldsburg, Ohio

Filed June 15, 1971, Ser. No. 153,283

Int. Cl. F23d *13/12*

U.S. Cl. 431—328 **5 Claims**



A gas burner for producing a type of flame especially useful in the glazing of glassware. It comprises an elongated distribution chamber having a narrow inlet slot in its rear wall and forwardly spaced perforated baffle plates so arranged as to break up the gas introduced through the inlet slot under high pressure to prevent it from blowing out from the chamber excessively and so that a wide surface, uniform temperature flame is produced which is especially suitable for the glazing of glassware.

ERRATA

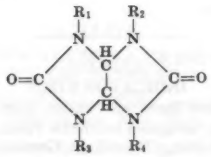
For Classes 432—122 to 432—4 see:
Patents Nos. 3,715,109 thru 3,715,111

3,715,184
METHOD OF ACTIVATING PER-COMPOUNDS AND SOLID ACTIVATED PER-COMPOUND COMPOSITIONS

Dieter Kuhling, Monheim, Rhineland, and Hans-Joachim Heitland, Dusseldorf, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Continuation-in-part of Ser. Nos. 787,597, Dec. 27, 1968, abandoned, and Ser. No. 787,628, Dec. 27, 1968, abandoned. This application May 7, 1971, Ser. No. 141,372
Claims priority, application Germany, Dec. 30, 1967, H 64 924; Dec. 30, 1967, H 64 923
Int. Cl. D06l *3/02*
U.S. Cl. 8—111 **12 Claims**

The method of activating aqueous solutions of per-compounds utilizing an activator acylated glycoluril and solid activated compositions of solid per-compounds and an activator acylated glycoluril, said activator acylated glycoluril having the formula



wherein at least two of R_1, R_2, R_3 and R_4 are acyls of organic carboxylic acids having from two to eight carbon atoms and the remainder of R_1, R_2, R_3 and R_4 are members selected from the group consisting of hydrogen, alkyl having from one to eight carbon atoms, phenyl, phenylalkyl having from seven to eight carbon atoms and acyls of organic carboxylic acids having from two to eight carbon atoms, and novel acylated glycolurils.

3,715,185
COMPOSITIONS FOR FLAME-PROOFING CELLULOSIC MATERIALS

Joseph A. Meyers III, Springfield, and Joseph A. Cahill, Philadelphia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Original application Oct. 30, 1970, Ser. No. 85,815, now Patent No. 3,666,402, dated May 30, 1972. Divided and this application Dec. 30, 1971, Ser. No. 214,457
Int. Cl. D06m *13/44*
U.S. Cl. 8—194 **4 Claims**

Fire resistance and wrinkle resistance are imparted to cellulosic materials by treatment with N,N′,N″-triallyl phosphoric triamide without adversely affecting other properties of the cellulosic materials. The treating compositions and the treated article are also disclosed.

3,715,186
DRYCLEANING METHOD AND DETERGENTS THEREFOR

Athanasious P. Anninos, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

No Drawing. Continuation of application Ser. No. 539,675, Apr. 4, 1966. This application Oct. 27, 1969, Ser. No. 871,734
Int. Cl. D06l *1/00*
U.S. Cl. 8—142 **6 Claims**

The present invention relates to a method of drycleaning fabrics, such as garments and other dry-cleanable materials, which provides improved detergency and reduced soil redeposition. The invention also relates to particular cationic surface-active agents for use in the improved method as the primary detergent and to specific combinations of such surfactants in a drycleaning system utilizing a moisturized solvent. In addition, the invention also relates to a process for the synthesis of a preferred type of surface-active agent for use in the process.

3,715,187
METHOD OF REMOVING SULPHUR DIOXIDE AND NITROGEN DIOXIDE FROM GASES

Roger F. Bartholomew, Corning, and Harmon M. Garfinkel, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed April 14, 1971, Ser. No. 134,082
Int. Cl. C01b *17/22*
U.S. Cl. 423—235 **4 Claims**

Method of removing SO_2 and NO_2 or SO_2 alone from gaseous mixtures passing the gaseous mixtures through a molten bath of sodium hydroxide and/or potassium hydroxide.

3,715,188
CHOLESTEROL ASSAY AND REAGENTS THEREFOR

Jerry W. Denney, Carmel, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Filed April 30, 1971, Ser. No. 139,266
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **11 Claims**

A cholesterol assay, using formamide, which achieves the simplicity of a direct test of a specimen sample, yet which also achieves a comparable specificity and accuracy of cholesterol assays involving multiple-extraction steps. The formamide destroys the cholesterol chromophore of a blank measurement, and this result may be compared with a companion cholesterol assay to eliminate the error caused by the chromophore of non-cholesterol chromogenic substances of the specimen; and the formamide also keeps the alcohol, which is used to prevent turbidity, from blocking the formation of the bilirubin portion of the non-cholesterol chromogenic substances.

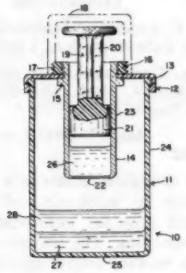
3,715,189
QUALITATIVE ANALYSIS DEVICE

Sarkie Nighohossian, Baltimore, and John J. Tobin, Jr., Hyattsville, both of Md., assignors to The United States of America as represented by the Secretary of the Treasury

Filed June 15, 1970, Ser. No. 46,365
Int. Cl. G01n *1/10;* **B65d** *81/00, 79/00*
U.S. Cl. 23—259 **1 Claim**

A qualitative analysis device which allows for the performance of a qualitative analysis for cannabis material in vegetable matter which required a performed extraction step

followed by a reaction step. The device has an outer container and an inner container within the outer container. The inner container has a frangible section and is also provided with a

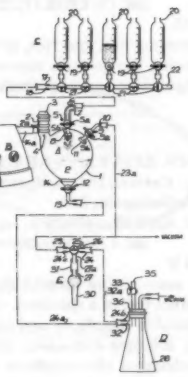


means for breaking the frangible section. The device is sealable so that the reagents may be stored within the device and be ready for use at any time.

3,715,190
SYSTEM FOR THE SOLID-PHASE PEPTIDE SYNTHESIS

Won Kil Park, Sherbrooke, Quebec, and Domenico Regoli, Magog, Quebec, Canada, assignors to University de Sherbrooke, Sherbrooke, Quebec, Canada

Filed Sept. 23, 1971, Ser. No. 182,938
Int. Cl. C07c *103/52*
U.S. Cl. 23—252 R **13 Claims**



Apparatus for the solid-phase peptide synthesis which comprises a reaction vessel consisting of a flask having a side arm defining an inlet through which a polymer can be inserted into the flask. Means are provided to separately insert a solvent and a reagent inside the flask while they are distributed uniformly along the inner walls of the flask. At the bottom of the flask, there are means to remove the solvent and waste products from the flask, preferably by suction. The flask has an opening to permit an entry of air inside the flask in order to control the pressure inside the flask and to facilitate removal of solvent and waste products. The apparatus also comprises means associated with the reaction vessel to shake the latter and to cause synthesis of the peptide to take place. The solvent and reagent are contained in reservoirs which are connected to the reaction vessel at a point where the latter separately introduces solvent and reagent therein. Finally, means are provided to cleave the peptide when the synthesis is terminated.

3,715,191
APPARATUS FOR MAKING WET PROCESS PHOSPHORIC ACID

William E. Rushton, South Holland; Gordon E. Seavoy, Chicago, and Woodruff A. Morey, Flossmoor, all of Ill., assignors to Whiting Corporation

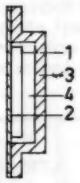
Filed July 13, 1970, Ser. No. 54,438
Int. Cl. C01b *25/22*; **B01j** *1/00*
U.S. Cl. 23—260 **5 Claims**

An apparatus and method for improving the filterability of wet process phosphoric acid reaction slurry. The slurry is divided into a least two segments, one of which contains only calcium sulfate crystal particles below a predetermined size, for example, only particles below 200 mesh, ant the other segment contains the remaining larger size calcium sulfate crystal particles. The slurry segment containing the larger particles is then discharged directly onto the porous filter media, usually filter cloth, with the larger crystal particles collecting thereon. The slurry segment containing the smaller size calcium sulfate crystal particles is then deposited directly onto the larger crystal particles which have collected on the porous filter media. In this manner, the crystal fines are effectively prevented from blinding the porous filter media, thereby prolonging the life thereof without reducing the capacity or efficiency of such filter.

3,715,192
INDICATOR STRIP

Adolf Wenz; Alfred Stein, and Dieter Schmitt, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Aug. 7, 1970, Ser. No. 62,017
Claims priority, application Germany, Aug. 12, 1969, P 19 40 964.4
Int. Cl. G01n *31/22, 33/16*
U.S. Cl. 23—253 TP **24 Claims**



An indicator strip, useful in analytical chemical procedures, which comprises an impregnated capillary material having at least a partially transparent film on one side and on the other side, a film forming a hollow space which is in communication with said capillary material.

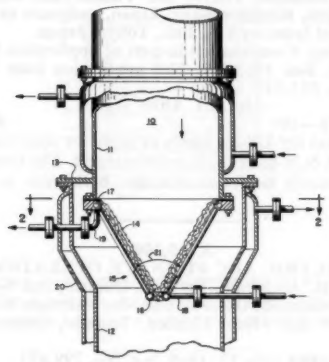
3,715,193
CATALYST SUPPORT

Samuel Strelzoff, 12 West 96th Street, New York, N.Y.

Filed March 1, 1971, Ser. No. 119,670
Int. Cl. B01j *9/04*; **C01b** *21/28*; **F28f** *1/00*
U.S. Cl. 23—288 R **3 Claims**

A support for a metallic gauze catalyst in a reactor for manufacturing hydrocyanic acid or nitrogen oxides is made up of a plurality of hollow tubular members disposed in a conical

configuration. Heat transfer media flows within the hollow tubular members which make up the conical support to maintain



a more uniform temperature of the catalyst and permit the use of less costly materials for catalyst support structures.

3,715,194

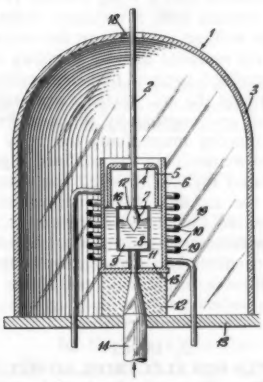
MELT GROWN ALUMINA CRYSTALS AND PROCESS THEREFOR

Myron N. Plooster, Boulder, Colo., assignor to Union Carbide Corporation, New York, N.Y.

Division of application Ser. No. 770,894, Oct. 22, 1968, which is a continuation of application Ser. No. 481,194, Aug. 20, 1965, which in turn is a continuation-in-part of application Ser. No. 300,178, Aug. 6, 1963, all now abandoned. This application Oct. 29, 1970, Ser. No. 85,261

Int. Cl. B01g *17/18;* **C01f** *7/02*

U.S. Cl. 23—301 SP **7 Claims**



Massive alpha alumina unicrystalline material substantially free of internal strain and crystal misorientation is provided. A process for producing such material by pulling from an alumina melt is also provided.

3,715,195

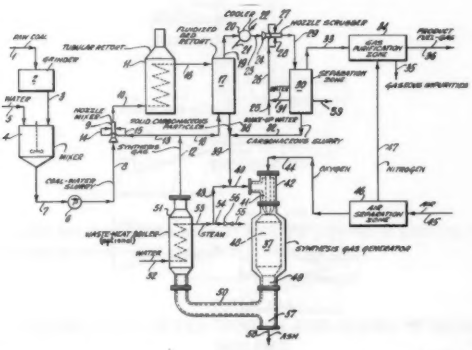
MULTIHYDROTORTING OF COAL

Joseph P. Tassoney, Whittier, and Warren G. Schlinger, Pasadena, Calif. (both % Texaco Inc., P.O. Box 400, Montebello, Calif. 90640)

Filed June 30, 1971, Ser. No. 158,468

Int. Cl. C07c *9/04;* **C10j** *3/46*

U.S. Cl. 48—197 R **12 Claims**



This is a noncatalytic multihydrotorting process for maximizing the conversion of coal into nonpolluting fuel gas. A pumpable coal-water slurry in admixture with a stream of synthesis gas is passed through a tubular retort where it is heated to a temperature in the range of about 600 to 1300° F. in the absence of air. The solid coal particles are fragmentized and carbonized in the tubular retort, the volatile constituents in said slurry are volatilized and simultaneously hydrogenation of the process stream takes place. The effluent from the tubular retort is then introduced into a fluidized bed retort along with a second stream of synthesis gas. Thermal decomposition of the carbonaceous materials takes place in the absence of air and the process stream is hydrogenated for a second time. Off-gas from the fluidized bed is then scrubbed and purified to produce nonpolluting fuel gas having a high heating value. Spent carbonaceous particles leaving the fluidized bed retort are introduced into a free-flow noncatalytic gas generator for conversion into preferably methane-rich synthesis gas by partial oxidation for use in the aforesaid two hydrotorting stages.

3,715,196

LOW-EXPANSION GLASS-CERAMIC CEMENTING METHOD

Max R. Montierth, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 2, 1970, Ser. No. 69,133

Int. Cl. C03b *29/00, 27/00*

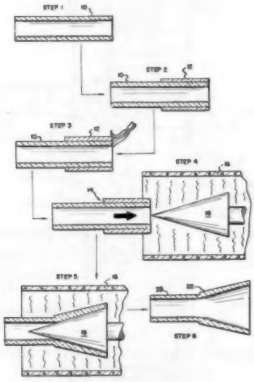
U.S. Cl. 65—33 **5 Claims**

A cementing composition and method suitable for bonding together glass-ceramic structures comprising preparing a mixture containing a thermally devitrifiable glass and a flux containing a quantity of silica fibers, applying said mixture to the glass-ceramic components to be bonded, and thereafter heat treating the cemented structure so that the cement is cured to a glass-ceramic bond which closely matches the glass-ceramic components in microstructure and thermal properties.

3,715,197
METHOD AND PREFORM FOR RESHAPING GLASS TUBING

Raymond Nalepka, Farmington, Mich., assignor to The Bendix Corporation

Filed Dec. 10, 1970, Ser. No. 96,811
Int. Cl. C03b *23/08, 23/20*
U.S. Cl. 65—54 4 Claims

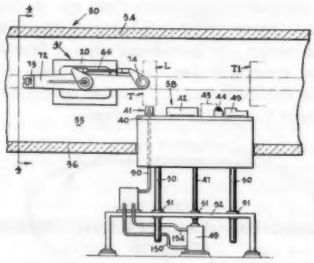


A method and preform for flaring or otherwise reshaping stock glass tubing is disclosed, in which an additional section of glass tubing is placed over the existing section of the glass tubing to be flared or reshaped and fused thereto at one end to create the preform, with conventional flaring or reshaping techniques then being applied to this preform to yield a flared or otherwise reshaped section of a relatively heavy-walled construction.

3,715,198
APPARATUS FOR PRODUCING ALL-GLASS MULTIPLE SHEET GLAZING UNITS

Lawrence C. Wheat, and Orville L. Tary, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed July 6, 1970, Ser. No. 52,471
Int. Cl. C03b *23/20*
U.S. Cl. 65—152 7 Claims



This application discloses, as part of the production of all-glass multiple sheet glazing units, the forming of a continuous edge wall around the margins of two spaced glass sheets by heating the edge portions of the sheets to a semi-plastic condition and then pressing them together by a rolling action to form an integrally sealed wall. The burners and forming rolls for this purpose are mounted on a support element which also carries a sensing or detecting device adapted to actuate control means that will produce movement of the support element and thereby locate the forming rolls at a desired working elevation relative to the edge portions of the sheets.

3,715,199
METHOD OF KILLING WEEDS IN RICE CROPS UTILIZING BENZYL N,N-DIALKYL-DITHIO-CARBAMATES

Shigeki Wakamori and Yoshio Yoshida, Kanagawa-ken, Sanji Yamauchi, Tokyo, and Yoshio Ishii and Muneharu Goto, Kanagawa-ken, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

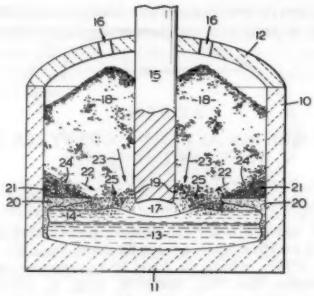
No Drawing. Continuation-in-part of application Ser. No. 609,323, Jan. 16, 1967. This application June 6, 1969, Ser. No. 831,247
Int. Cl. A01n *9/12*
U.S. Cl. 71—101 4 Claims

A method for killing weeds in crops by applying to the soil benzyl N,N-dialkyl dithiocarbamates. The compounds are particularly useful as selective herbicides in aquatic rice crops.

3,715,200
ELECTRIC ARC FURNACE OPERATION

Frederick R. Archibald, Toronto, Ontario, and Gerald G. Hatch, Islington, Ontario, Canada, assignors to Falconbridge Nickel Mines Limited, Toronto, Ontario, Canada

Filed Feb. 17, 1969, Ser. No. 799,871
Int. Cl. C21c *5/52;* C22d *7/04;* H05b *11/00*
U.S. Cl. 75—10 6 Claims



An improved method for continuous melting of particulate material in an electric arc furnace. The particles are rendered as a body free-flowing and substantially non-conductive electrically and a body thereof is established around and in contact with a vertically adjustable electrode and a high voltage arc between the electrode and a molten bath of the material thereby shielding the arc and establishing a confined zone of high temperature in contact with and around the arc. Particles are melted in contact with the arc and continually replaced by others as melting occurs thereby maintaining the body in contact with the arc and maintaining the confined high temperature zone for rapid melting therein. The distribution of power between the arc and bath is controlled to favour release of power in the arc and thereby achieve high throughput of particles per unit area of furnace hearth. The method is particularly advantageous in the recovery of ferronickel from nickeliferous ores of the oxide and silicate types.

3,715,201
APPARATUS FOR ELECTROSLAG MELTING

Rene Schlatter, Derry Township, Westmoreland County, Pa., assignor to Latrobe Steel Company

Filed Sept. 30, 1970, Ser. No. 76,761
Int. Cl. C22d *7/00;* C22b *9/10;* B23k *35/34*
U.S. Cl. 75—10 7 Claims

A consumable electrode electroslag apparatus and method are provided in which an ingot mold rests on a conductive

stool and an electrode to be remelted is lowered into the mold to contact and arc against a vertical ignition pin on a starting

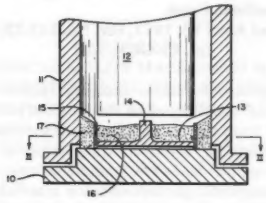


plate resting on the stool and surrounded by an exothermic flux confined within a consumable cylinder which is in turn surrounded by a mixture of a standard working flux.

3,715,202

METHOD FOR DESULPHURIZING PIG IRON

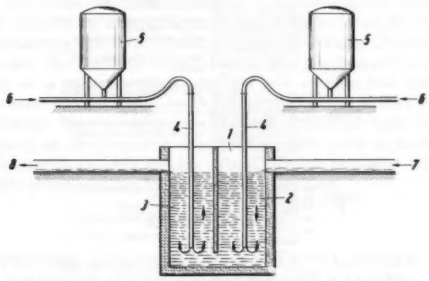
Hans Kosmider, Bremen-Lesum, and Dieter Danckert, Brankland, both of Germany, assignors to Klockner-Werke Aktiengesellschaft, Duisburg, Germany

Filed Feb. 16, 1971, Ser. No. 115,296

Claims priority, application Germany, March 6, 1970, P 20 10 585.5

Int. Cl. C21b *3/02, 11/08*

U.S. Cl. 75—58 **7 Claims**



A method for the desulphurization of pig iron envisioning a continuously flowing pig iron stream having a descending flow portion in which a desulphurizer ascends in opposite flow direction.

3,715,203

MELTING OF METALS

Edouard De Bie, Antwerp, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

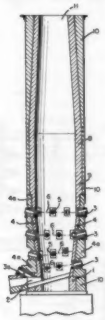
Filed Dec. 22, 1970, Ser. No. 100,758

Claims priority, application Luxembourg, Dec. 24, 1969, 60.094

Int. Cl. C22b *15/00, 15/14*

U.S. Cl. 75—76 **18 Claims**

The invention relates to a process for melting and refining copper in a vertical furnace by direct contact of copper pieces with hot gases produced by combustion of a non-solid fuel with an oxygen-containing gas ignited before coming into contact with the copper pieces, the said gas being substantially neutral, the variation around the neutral point being such that the oxygen contents shall be lower than about 0.5 percent of O_2 and the hydrogen contents shall be lower than about 0.5 percent of hydrogen, and the pressure being such that the ignited has leaving the burners shall be capable of piercing the liquid mass situated at the level of the burners.



3,715,204

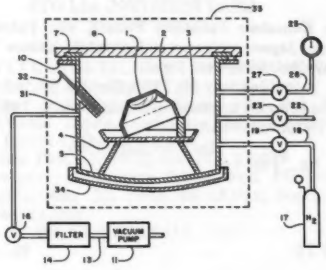
SEPARATION OF PLUTONIUM AND URANIUM FROM HOLDER

Robert P. DeGrazio, Boulder, and Herbert N. Robinson, Denver, both of Colo., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 28, 1971, Ser. No. 147,901

Int. Cl. B22d *29/00*

U.S. Cl. 75—84.1 R **6 Claims**



Method of separating plutonium or uranium from a holder, e.g., for facilitating removal of a plutonium or uranium piece from a crucible, by hydriding under a controlled atmosphere at 25° to 100° C.

3,715,205

METHOD FOR REDUCING CHLORIDES AND A DEVICE THEREFOR

Hiroshi Ishizuka, 19-2 Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Jan. 7, 1971, Ser. No. 104,720

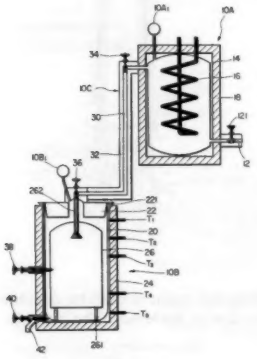
Claims priority, application Japan, Jan. 8, 1970, 45/2606; Jan. 10, 1970, 45/3075; Jan. 9, 1970, 45/3082; Aug. 8, 1970, 45/69495

Int. Cl. C22b *53/00*

U.S. Cl. 75—84.5 **8 Claims**

A method for reducing a metal chloride, especially for reducing a chloride of sublimable metal by using a metallic reducing agent, and a device therefor. A tank for storing the starting metal chloride is connected to a separate reducing chamber through a pipe, which tank and chamber are heated

by separate heat sources, respectively. The metallic reducing agent is heated, so as to form gaseous phase thereof which gaseous phase is kept at a temperature higher than the melting point of the metal and brought into contact with the vapor of



the starting metal chloride to cause the reducing reaction. The reduction is effected while measuring and controlling the flow rate of the starting metal chloride vapor to the reducing chamber.

3,715,206

HEAT RESISTING ALLOYS

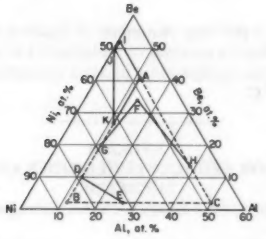
Noboru Komatsu; Takatoshi Suzuki, and Takuo Ito, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed July 29, 1970, Ser. No. 59,169

Claims priority, application Japan, Aug. 2, 1969, 45/61344; May 8, 1970, 45/39463

Int. Cl. C22c *19/00*

U.S. Cl. 75—170 **4 Claims**



The invention concerns with highly improved heat resisting Ni–Al–Be alloys.

The improvement resides in the selection of specific alloying ratios as determined by a certain specific polygonal area plotted on a triangular coordinate diagram of Ni, Al and Be, for general improvement of the high temperature antioxidation performance, high temperature strength and high temperature toughness of the alloys.

3,715,207

ELECTROSTATICALLY DEFORMABLE THERMOPLASTIC LAYER CONTAINING A 1,4-DIALKYLAMINO-9,10-ANTHRAQUINONE DYE

Roger N. Ciccarelli, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed April 13, 1971, Ser. No. 133,735

Int. Cl. G03g *5/02*

U.S. Cl. 96—1.5 **3 Claims**

A thermoplastic-deformable imaging system is provided which absorbs substantially all of the incident radiation which is not reflected from the thermoplastic-air interface of a thermoplastic deformable layer residing over an underlying photoconductive layer so as to eliminate secondary reflection from the thermoplastic-photoconductor interface. The thermoplastic deformable layer is provided with an absorbing pigment which substantially absorbs non-reflected radiation so that this radiation is not secondarily reflected.

3,715,208

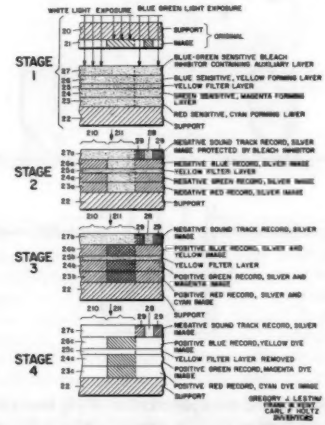
FILM CONTAINING BLEACH INHIBITOR AND PROCESS THEREFOR FOR PRODUCING COLOR FILM WITH SILVER SOUND RECORD

Gregory J. Lestina; Frank W. Kent, and Carl F. Holtz, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 100,613, Dec. 22, 1970, abandoned. This application Dec. 17, 1971, Ser. No. 209,458

Int. Cl. G03c *5/44, 5/24*

U.S. Cl. 96—4 **48 Claims**


WHITE LIGHT EXPOSURE
BLUE GREEN LIGHT EXPOSURE
STAGE 1
STAGE 2
STAGE 3
STAGE 4
SUPPORT
IMAGE
ORIGINAL
BLUE-GREEN SENSITIVE BLEACH INHIBITOR CONTAINING AUXILIARY LAYER
BLUE SENSITIVE, YELLOW FORMING LAYER
YELLOW FILTER LAYER
GREEN SENSITIVE, MAGENTA FORMING LAYER
RED SENSITIVE, CYAN FORMING LAYER
NEGATIVE SOUND TRACK RECORD, SILVER IMAGE PROTECTED BY BLEACH INHIBITOR
NEGATIVE BLUE RECORD, SILVER IMAGE
NEGATIVE GREEN RECORD, SILVER IMAGE
NEGATIVE RED RECORD, SILVER IMAGE
POSITIVE BLUE RECORD, SILVER AND YELLOW IMAGE
POSITIVE GREEN RECORD, SILVER AND MAGENTA IMAGE
POSITIVE RED RECORD, SILVER AND CYAN IMAGE
POSITIVE BLUE RECORD, YELLOW DYE IMAGE
YELLOW FILTER LAYER REMOVED
POSITIVE GREEN RECORD, MAGENTA DYE IMAGE
POSITIVE RED RECORD, CYAN DYE IMAGE
GREGORY J. LESTINA
FRANK W. KENT
CARL F. HOLTZ
INVENTORS

A novel process of producing a picture record and a silver auxiliary image or sound track record in an imagewise exposed photographic element comprising a support having coated thereon, on one surface, at least one picture recording photographic image-forming unit comprising at least one silver halide emulsion layer and an auxiliary image radiation sensitive silver halide layer which does not form an image upon image-forming exposure of the picture recording unit or units, which auxiliary layer contains a nondiffusible ballasted silver bleach inhibitor, which process comprises (A) developing silver halide in said element with a black-and-white developing agent to form a silver picture record in said picture recording unit or units and a silver auxiliary image record or sound track record in said auxiliary layer, (B) fogging and developing silver halide in the element with aromatic primary amine color developing agent in the presence of a photographic color coupler to form a picture record comprising silver and a nondiffusible dye in the picture recording unit or units and thereafter (C) removing the residual silver halide

and bleachable silver remaining after steps (A) and (B) by bleaching and fixing while retaining silver in the auxiliary layer to form the silver auxiliary image or silver sound track record. Also provided are novel photographic elements of the type described above.

3,715,209

ELECTRICAL COLOR MASKING IN A PHOTO ELECTROPHORETIC IMAGING PROCESS

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 27, 1970, Ser. No. 15,103
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.2 **7 Claims**

The densities of pigments comprising an image are altered in electrophoretic imaging systems by supressing or enhancing pigment migration in an electric field by employing in selected areas electrostatic charge to increase or decrease the field effecting migration.

3,715,210

LITHOGRAPHIC PRINTING PLATES

Leonard J. Watkinson, Leeds, and Anthony Peter Service, Selby, both of England, assignors to Howson-Algraphy Limited, London, England

Continuation-in-part of Ser. No. 742,495, July 5, 1968, abandoned. This application Feb. 19, 1971, Ser. No. 117,079
Claims priority, application Great Britain, Aug. 18, 1966, 37,135/66; Italy, Aug. 17, 1967, 38841 A/67; July 1, 1968, 38080 A/68; Norway, July 3, 1968, 3274; July 3, 1968, 2667; Sweden, July 3, 1968, 9143/68; Australia, July 4, 1968, 6416; South Africa, July 4, 1968, 4301
Int. Cl. G03f *7/02*; G03c *1/52*, *1/64*
U.S. Cl. 96—33 **8 Claims**

A light sensitive plate comprises a support coated with a layer comprising a tannable resin and a diazo or azido compound having light decomposition products capable of tanning the resin. The tannable resin is low viscosity hydroxyethyl cellulose or a polymer of acrylamide and at least two other monomers containing up to 30 percent by weight of the other monomers. The monomers are selected so that the layer does not swell on development. The light sensitive plate is storage stable and is suitable for the production of half-tone lithographic printing plates by the deep-etch process.

3,715,211

PROCESS AND PRODUCT OF COLD SEALING AN ANODIZED ALUMINUM ARTICLE BY A PHOTOPOLYMERIZATION PROCESS

Harold J. Quaintance, Fairview Park, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated

Filed Feb. 1, 1971, Ser. No. 111,648
Int. Cl. G03c *1/94*; B32b *15/08*
U.S. Cl. 96—35.1 **11 Claims**

A method of cold sealing an anodized aluminum article comprising photopolymerizing a cross-linked polymer in situ in the pores of the surface of the anodized layer on the article and the product produced thereby are described.

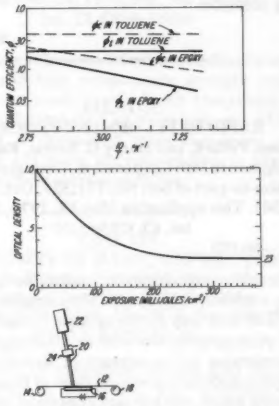
3,715,212

PHOTOCHROMIC DISPLAY AND STORAGE DEVICE AND METHOD OF OPERATION THEREOF

Daniel Louis Ross, Princeton, N.J., assignor to RCA Corp.

Filed Dec. 7, 1970, Ser. No. 95,578
Int. Cl. G03c *5/24*, *1/72*
U.S. Cl. 96—48 **9 Claims**

A photochromic display and storage element having a relatively high photochromic efficiency at temperatures above room temperature and a relatively low photochromic efficiency at room temperature consists of a substituted thioindigo dye dissolved in a heat-cured epoxy resin having a glass transition temperature of between above room temperature and 100°C. Information is placed on the element by heating it to or above the glass transition temperature and shining light of a first wavelength (write light) on the element. The image is



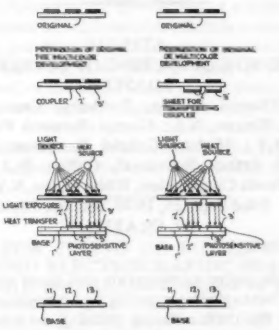
stored by cooling the element to room temperature. In order to read the image, light of a second wavelength (read light) is passed through the element at room temperature. The image is erased with light of this second wavelength by first heating the element to or above the glass transition temperature.

3,715,213

DIAZO-TYPE MULTICOLOR REPRODUCTION

Kouzi Nihyakumen and Taizo Yokoyama, Osaka, Yasuo Ueda, Kobe, and Yasutoki Kamezawa and Tatsuo Aizawa, Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Feb. 17, 1970, Ser. No. 12,049
Claims priority, application Japan, Feb. 19, 1969, 44/11,914; Aug. 22, 1969, 44/65,980; Nov. 18, 1969, 44/91,964
Int. Cl. G03c *5/18*, *1/58*
U.S. Cl. 96—49 **12 Claims**



A process for the diazo-type multicolor reproduction by which portions of a sensitive paper corresponding to pre-

determined portions of an original can be selectively colored to different hues by disposing a layer of thermotransferable coupler between an original and diazo-photosensitive paper followed by exposure to light and heating of the assembly. The layer of thermotransferable coupler is not applied to the entire image area of the original and the thermotransferable coupler is faster in coupling rate with the diazonium salt under the development conditions than the basic color coupler of the photosensitive paper or developing solution.

3,715,214

RAPID DEVELOPMENT PROCESS

John R. Kane, Piffard, and Harry G. Morse, Rochester, both of N.Y., assignors to Itek Corporation, Lexington, Mass.

Continuation-in-part of Ser. No. 771,325, Oct. 28, 1968, Pat. No. 3,582,341. This application May 18, 1970, Ser. No. 38,548

Int. Cl. G03c *5/30*

U.S. Cl. 96—66 HD **18 Claims**

A process and compositions for rapidly developing and fixing a high contrast, low speed photographic film such as microfilm. The first step in the process comprises contact of an exposed photographic film with an alkaline developer composition comprising (*a*) a mixture of hydroquinone and 1-phenyl-3-pyrazoli-done in a weight ratio of from 15:1 to 6:1 as the developing agent, the mixture contained in the developer composition in an amount of from 15 to 40 grams per liter; and (*b*) potassium sulfite as preservative in an amount from 60 to 120 grams per liter. Preferably, the developer composition has a pH from about 10 to 11 and contains a restrainer such as potassium bromide in an amount of from 2 to 10 grams per liter.

Following contact with the developer composition, the developed film is preferably contacted with a fixer such as one comprising from 200 to 400 grams per liter sodium thiosulfate crystals, 50 to 100 grams per liter of potassium sulfite and 100 to 200 grams per liter of ammonium thiocyanate.

The process of the invention provides rapid development of high contrast, low speed films and has, for example, a capability of developing microfilm in about 10 seconds or less. The high speed is believed to be attributable, at least in part, to the use of the above-noted combination of developing agents. Moreover, the process results in a developed negative free of a uniform red coloration or stain characteristic of films of this nature. Finally, the developer composition is highly resistant to the detrimental effects of aeration, has excellent keeping qualities and can be stored for long periods of time without noticeable deterioration.

3,715,215

SUCCESSIVE QUENCHING OF COFFEE DURING ROASTING

Theodore Thomas Balling, Danbury, Conn.; Richard J. Leonard, Wayne, N.J.; George Bernard Ponzoni, Spring Valley, N.Y.; Michael Gabriel Protomastro, Woodridge, N.J., and Arthur Stefanucci, Clifton, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,681

Int. Cl. A23f *1/02*

U.S. Cl. 99—68 **9 Claims**

Undesirable aroma components and gases can be removed from coffee beans during roasting by intermittent additions of moisture to the coffee during roasting, in amounts ranging from 3 percent to 40 percent by weight of the beans, thereby driving out the volatiles and unexpectedly improving the flavor. This process of upgrading coffee and changing its flavor characteristics occurs within the same roaster.

3,715,216

BEVERAGE COMPOSITION

Jean-Jacques Wuhrmann, Vevey, and Elvira Cristofaro, St. Saphorin, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle SA, Lausanne, Switzerland

Filed Aug. 17, 1970, Ser. No. 64,658

Claims priority, application Switzerland, Sept. 5, 1969, 13483/69

Int. Cl. A23l *1/00*

U.S. Cl. 99—78 **14 Claims**

Beverage composition in the form of free flowing, granular particles comprising sugar, an edible acid and flavoring, in which the particles are agglomerated together with a binder consisting essentially of an edible fat and an edible gum. The binder composition functions as a clouding agent in the final beverage.

3,715,217

METHOD OF MAKING FREE-FLOWING FLAVORING POWDERS OF HIGH FLAVOR-CONCENTRATION AND PRODUCTS THEREOF

Edward W. Rosenbaum, Rydal, and Kurt L. Schoen, Philadelphia, Pa., assignors to David Michael & Co., Philadelphia, Pa.

No Drawing. Filed Aug. 15, 1967, Ser. No. 660,607

Int. Cl. A23l *1/26*

U.S. Cl. 99—140 R **4 Claims**

The method of making a dry, free-flowing flavoring powder (as, for instance, a vanilla powder having a flavor-concentration substantially higher than that of heretofore conventional sugar-base flavoring powders which comprises intermixing with a dry free-flowing micro-crystalline cellulose alone or with an admixture thereof with sugar and/or starch, such an amount of a concentrated flavoring liquid in relation to the amount of the microcrystalline cellulose that the flavoring constituents contained in the amount of flavoring liquid so used will be substantially greater (of the order twice as much or more) than the flavoring constituents which can be admixed with sugar alone in the production of a conventional sugar-base dry free-flowing flavoring powder, thereafter drying such admixture by passing heated air thereover until the resultant product is friable and pulverizable, and thereafter crushing and pulverizing the resultant friable mass. The resulting dry free-flowing flavoring powder having a flavor concentration substantially higher than that of heretofore conventional sugar-base flavoring powders, and including a dry free-flowing micro-crystalline cellulose on the particles of which a concentrated flavoring liquid has been dried in situ.

3,715,218

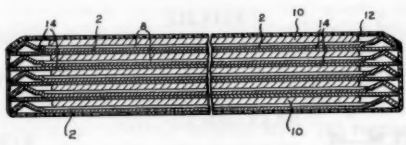
BACON CONTAINER

Robert L. Feely, Emmaus, Pa., assignor to Arbogast & Bastian, Inc., Allentown, Pa.

Continuation-in-part of Ser. Nos. 846,470, July 31, 1969, abandoned, and Ser. No. 846,504, July 31, 1969, abandoned. This application April 20, 1970, Ser. No. 30,183

Int. Cl. B65b *25/06*

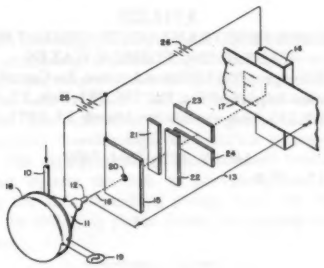
U.S. Cl. 99—174 **1 Claim**



An open face container of bacon consisting of a tray formed of thin, non-toxic metal having a generally flat central part which is ridged to provide substantial rigidity and which is sur-

rounded by a peripheral bead, and a layer of bacon slices on the tray within the bead, the bacon being raw or partially or fully cooked. The tray is used as the pan on which the cooking of the raw or partially cooked bacon is completed or the fully cooked bacon is warmed, and is disposable after use.

3,715,219
ELECTROSTATICALLY IMPROVEMENT IN ELECTO STATIC PRINTING
Philip F. Kurz, Columbus, Ohio, and Leonard A. Nash, Lake Forest, Ill., assignors to Teletype Corporation, Skokie, Ill.
Filed Sept. 23, 1969, Ser. No. 860,387
Int. Cl. C09d *11/00*
U.S. Cl. 106—22 **4 Claims**



An ink having a resistivity in the range of 10^8 to 10^{11} ohm-centimeters and a viscosity in a range with an upper limit of about 50 centipoises synchronously is formed into a uniform succession of ink drops in response to an alternating current. A stream of the ink drops is electrostatically drawn across and deflected in a span between the ink source and a carrier for printing thereon by drop impingement. The ink is a composition having about 3 percent by weight of a dye material and the remainder a vehicle comprised of at least one alcohol of the paraffin series which has the general formula $CH_3(CH_2)_nCH_2OH$ in which n is an integer between 12 and 16.

3,715,220
CERAMIC ARTICLE AND METHOD OF MAKING IT
James O. Confer, Tioga, Pa., and George D. McTaggart, Horseheads, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed March 19, 1969, Ser. No. 808,654
Int. Cl. C03c *3/22, 3/04, 3/30*
U.S. Cl. 106—39 DV **6 Claims**

Characterized by substantially zero coefficient of thermal expansion over a general range of room temperature variations, the article consists essentially of a sintered consolidated particulate mixture of substantially equal portions of first and second materials. First material is composed mainly of SiO_2 with critical lesser amounts of Al_2O_3 and Li_2O in a mole ratio of 1.5 or less. Second material is composed mainly of SiO_2 together with critical lesser amounts of Al_2O_3, TiO_2 and Li_2O constituting at least 95 wt. percent of the material and with small amounts of required MgO and optional ZnO. Green article formed of the particulate mixture is given three-stage heat treatment at progressively higher temperatures to develop the very low thermal expansion coefficient, sintering and substantial imperviousness to water and air.

3,715,221
OPTICAL GLASS
Edgar J. Greco, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 29, 1971, Ser. No. 111,113
Int. Cl. C03c *3/12, 3/30, 3/00*
U.S. Cl. 106—47 Q **10 Claims**

An optical glass having a high index of refraction, a low dispersion, and low color, consists essentially of lanthanum oxide (La_2O_3), thorium dioxide (ThO_2), tantalum pentoxide (Ta_2O_5), boric oxide (B_2O_3), silicon dioxide (SiO_2), and germanium dioxide (GeO_2).

3,715,222
BASIC REFRACTORY
Harry L. Hieb, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Dec. 21, 1970, Ser. No. 100,532
Int. Cl. C04b *35/04*
U.S. Cl. 106—58 **12 Claims**

A fired periclase refractory of enhanced density and volume stability and good high temperature strength and thermal shock resistance is made from a batch comprising relatively coarse aggregate having 97.5 or more per cent MgO and, as matrix material, a prereacted grain containing substantial amounts of lime and silica, the ratio of lime to silica being at least sufficient to form dicalcium silicate.

3,715,223
PRODUCTION OF BASIC REFRACTORIES
Edmund S. Wright, Clearfield, Pa., assignor to Eltra Corporation, Toledo, Ohio
No Drawing. Filed Mar. 12, 1971, Ser. No. 123,814
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 **4 Claims**

The production of magnesite chrome and chrome magnesite refractories is disclosed. The principal batch ingredients are from 40 to 80 parts by weight of dead burned magnesite or synthetic periclase and from 60 to 20 parts by weight of chrome ore. The magnesite or periclase and the chrome ore are suitably sized, mixed with minor batch ingredients, e.g. lime hydrate and lignin sulfate as a temporary binder, and tempered. The desired shape is then pressed from the tempered batch, and the shape is fired, e.g. to a temperature of 2500° F. or higher. Calcium nitrate is dissolved in the tempering liquid, prior to pressing of the desired shape; as a consequence of the calcium nitrate dissolved in the tempering liquid it has been found that the porosity of the final refractory is substantially reduced and as a consequence, it is believed, of the reduction in porosity, the final refractory has outstanding slag-resistance.

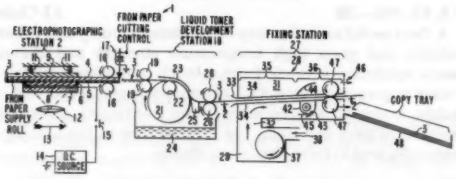
3,715,224
SOLUBLE AND COLLOIDAL SILICATES
Larry E. Campbell, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed June 12, 1970, Ser. No. 45,614
Int. Cl. C09d *1/04*
U.S. Cl. 106—74 **10 Claims**

This invention relates to the production of solutions and/or colloidal suspensions of water-soluble silicates containing certain monovalent and divalent cations which normally result in water-insoluble silicates. The process involves reacting in water a compound of the monovalent and/or divalent cations with a chelating or complexing agent exhibiting stability at a pH greater than 7 to yield a solution and/or colloidal suspension of complexed silicates. Where desired, the said solution and/or colloidal suspension can be cured to a solid body.

3,715,225
METHOD FOR FIXING OF LIQUID TONER DEVELOPED ELECTROGRAPHIC IMAGES
Gene F. Day, Sunnyvale, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed Apr. 5, 1971, Ser. No. 131,383
Int. Cl. B44d *1/094*
U.S. Cl. 117—21 **6 Claims**

An electrophotographic station deposits an electrostatic charge image on the charge retentive surface of an electrographic recording web, such image corresponding

to an image to be printed. The charge image bearing web is fed through a liquid toner development station wherein charged electroscopic pigment particles suspended in a dielectric liquid are applied to the charge image for developing same. The developer image bearing web, while still wet with excess liquid toner, is passed into a fixing station wherein a blower blows air over the toned side

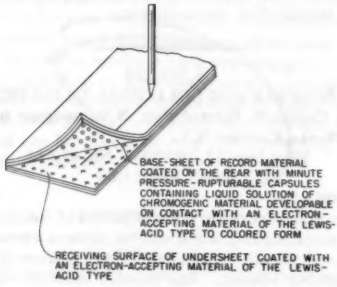


of the image bearing web for drying the web by an amount such that the remanent liquid toner will not flow under the action of the air stream. The at least partially dried image bearing web is then fed through an infrared heating station for fixing the toned image. The source of infrared radiation is shielded from the air drying section of the fixing station to prevent running of the image.

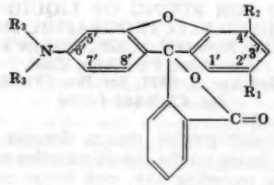
3,715,226
MARK-FORMING RECORD MATERIALS

Chao-Han Lin, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 792,325, Jan. 21, 1969, Pat. No. 3,697,757. This application March 1, 1971, Ser. No. 119,830
Int. Cl. B41m 5/22
U.S. Cl. 117—36.2 **19 Claims**


BASE-SHEET OF RECORD MATERIAL COATED ON THE REAR WITH MINUTE PRESSURE-RUPTURABLE CAPSULES CONTAINING LIQUID SOLUTION OF CHROMOGENIC MATERIAL DEVELOPABLE ON CONTACT WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE TO COLORED FORM
RECEIVING SURFACE OF UNDERSHEET COATED WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE

A chromogenic material of normally colorless form is disclosed, having a structural formula:



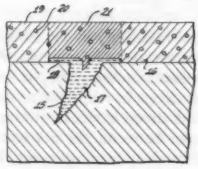
wherein R_1 represents -CO-R_4, and wherein R_4 represents hydrogen, —O—CH_3, and

R_2 represents hydrogen and alkyl radicals; and R_3 represents hydrogen and alkyl radicals having less than five carbon atoms; —said materials assuming a colored from upon reactive contact with a Lewis acid molecule. Examples include 6′-diethylamino-2′-formylfluoran; 2′-carbomethyoxy-6′-diethylaminofluoran; and 2′-benzoyl-6′-diethylamino-4′-methylfluoran.

3,715,227
INSPECTION PENETRANT DEVELOPMENT PROCESS EMPLOYING FUSIBLE WAXES

James R. Alburger, 5007 Hillard Avenue, La Canada, Calif.

Continuation-in-part of Ser. No. 799,701, Feb. 17, 1969, Pat. No. 3,607,333. This application March 23, 1971, Ser. No. 127,181
Int. Cl. B23p 7/04, 7/00
U.S. Cl. 117—37 R **2 Claims**



An improved process of inspection penetrant development employing a high-sensitivity, high-resolving power inspection penetrant developer in which the active developing ingredient is a waxy substance which is a solid or near-solid at room temperature but which becomes fluid at slightly elevated temperatures. The waxy developer material mat be dissolved in a suitable carrier liquid, such as water or other inert volatile solvent, and is deposited on test parts by dipping, brushing or spraying, and allowing the carrier liquid to evaporate. The development process includes the step of applying heat to the test parts, during oven drying or by hearing subsequent to air-drying, whereby the waxy developer layer becomes a fluid, and carries into solution any dyed penetrant entrapments present in the surface defects. When the test parts cool to room temperature, the fluid waxy layer, which now contains developed defect indications, solidifies and prevents excessive bleeding and migration of the indications.

3,715,228
METHOD FOR TREATING SURFACES OF BUILDING MATERIALS

Joseph Dulat, Syrena, England, assignor to United States Borax Chemical Corporation, Los Angeles, Calif.

Filed Jan. 25, 1971, Ser. No. 109,682
Int. Cl. B44d 1/44
U.S. Cl. 117—46 FC **6 Claims**

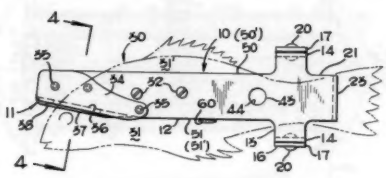
Building materials are treated with a flux and then heated with a high temperature flame in order to provide a decorative, durable glazed surface. Especially useful for inexpensive building materials such as low density bricks made from slag or other waste materials.

3,715,229

FISH CLEANING DEVICE

George E. Carnahan, 1007 Regent Terrace, Kirkwood, Mo.

Filed May 1, 1972, Ser. No. 249,363
Int. Cl. A22c 25/00
U.S. Cl. 17—66 6 Claims



This fish cleaning device includes a pair of clamping plates hingedly attached at one end. A guillotine blade is provided at the remote end of one of the clamping plates which is adapted to make an incision in the fish head, and the clamping plates are spaced from each other at the hinge end to permit the fish to be received therethrough for accurate positioning during incision. The clamping plates are narrowed forwardly of the hinge and overlie the fish to provide guide margins for trimming the fish. Retaining prongs hold the fish in place between the clamping plates during the cutting and trimming operations.

3,715,230

DUAL TREATMENT OF ASBESTOS FIBERS

Thomas Harry Sadler, Belle Mead, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 879,549, Nov. 24, 1969, abandoned. This application Feb. 12, 1971, Ser. No. 115,136
Int. Cl. B44d 1/16
U.S. Cl. 117—70 S 10 Claims

Treatment of asbestos fiber with a first coating of at least about 0.4 percent by weight of alkali-metal silicate solids or colloidal silica, and subsequent distribution of a non-foaming anionic dispersant on the coated fiber produces an asbestos fiber product that possesses improved filtration properties. The fiber product improves the production rate of articles from asbestos-cement slurries or pastes and eliminates the loss in strength of asbestos-cement articles that usually results from inclusion of silicate-treated fibers in the slurries or pastes.

3,715,231

STORAGE OF LIQUID HYDRAZINE ROCKET FUELS

Wahling H. Ng, Rockaway; William F. Lehman, Sparta, both of N.J., and John P. Young, Gaithersburg, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed May 28, 1971, Ser. No. 148,061
Int. Cl. B44d 1/02
U.S. Cl. 117—71 M 11 Claims

Liquid hydrazine fuels are stored in maraging steel containers for rocket systems provided with a thin protective lining of a metal of the group consisting of cadmium, silver, aluminum, nickel, tungsten, tin and alloys of tin with cadmium, nickel, and lead whereby the rate of decomposition of the fuel is greatly retarded and the fuel can be safely stored for long periods.

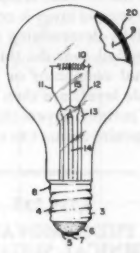
3,715,232

SHATTER-RESISTANT INCANDESCENT LAMP

Emery G. Audesse, Salem; Alexander Tartakoff, Beverly, and John K. Robertson, Lynn, all of Mass., assignors to GTE Sylvania Incorporated

Filed July 1, 1971, Ser. No. 158,712
Int. Cl. C03c 17/30; F21v 3/04
U.S. Cl. 117—72 2 Claims

An electric lamp having a glass envelope with a tacky, shatter-resistant silicone rubber coating over the envelope and



a coating over that of a hard, heat resistant silicone material to resist the accumulation of dust on the tacky coating.

3,715,233

PROCESS FOR PREPARING FIBERGLASS PREFORMS

Jack L. Harrier, Lansing, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Sept. 18, 1970, Ser. No. 73,663
Int. Cl. B32b 17/04
U.S. Cl. 117—126 GB 12 Claims

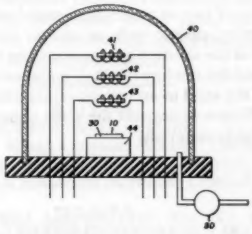
An improved process for the preparation of a polyester resin that can be solubilized in water as formed, and, when partially cured is insoluble in, but permeable to, polymerizable monomers such as styrene which comprises admixing a mixture of polycarboxyl-affording substances with a polyhydroxyl-affording substance and heating the mixture in the temperature range of 300°-450°F. until a thin sample of the material cures at 392°F. in from about 10 to about 40 seconds. The method of binding glass fibers into a mass suitable for reinforced-fiber molding purposes which comprises the steps of treating fibrous glass with the resin solubilized in water to form a resin-fiberglass composite and partially curing said composite at a temperature above about 200°F. until a water-insoluble, styrene-insoluble but styrene permeable composite is formed.

3,715,234

NON-RECTIFYING COMPOSITE CONTACT FOR SEMICONDUCTOR DEVICES

Ronald A. Stott, North Syracuse, N.Y., assignor to General Electric Company

Division of Ser. No. 746,861, July 23, 1968, abandoned. This application Dec. 28, 1970, Ser. No. 102,065
Int. Cl. B44d 1/18
U.S. Cl. 117—217 2 Claims



This invention relates to an improved non-rectifying metallic contact for a semiconductor body comprising a composite structure made up of a plurality of interdiffused layers. This composite structure consists of a first layer of metallic material non-rectifyingly bonded to the surface of said body. A

second layer of metallic metal surmounts said first layer to prevent the mixing of said first layer with any other layer at temperatures below the eutectic temperature of said first layer with said body. The second layer is covered by a third layer of an N-type conductivity-determining material. A fourth layer of noble metal is applied over the third layer to facilitate soldering of an external connector or support member to the contact. The multiple layers are then heated to form an interdiffused mixture of metallic layers that produce an adherent, non-rectifying, composite contact to said body.

3,715,235

PROCESS FOR THE REMOVAL OF IMPURITIES FROM TECHNICAL SUGAR SOLUTIONS

Erich Moebes, Enns, Austria, and Hans Hitzel, Frankfurt am Main, Germany, assignors to Sugar Chemical Co., Etablissement Vaduz/Furstentum, Liechtenstein

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,581

Claims priority, application Austria, Oct. 16, 1970, 9,364

Int. Cl. C13d *3/14*

U.S. Cl. 127—46 A **6 Claims**

Technical sugar solution is pretreated by ion exchange with carbonate and/or bicarbonate exchangers in combination with an ammonium or weakly acidic cation exchanger in the hydrogen form. The pretreated solution or a solution obtained after removal of a portion of the sugar by crystallization from the pretreated solution is brought into ion exchange contact with a cation exchanger in the hydrogen form. The resulting solution is recycled to and passed through the carbonate and/or bicarbonate exchange employed in the pretreatment step without prior regeneration of that exchanger.

3,715,236

DESCALING METHOD FOR STEEL

Saburo Fukui; Tsunehiro Yamazaki, both of Hiroshima; Masato Yamamoto, Asa-gun; Masuichi Miyake, Saiki-gun, and Masanori Okumoto, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 818,110, April 21, 1969, abandoned, and a continuation-in-part of Ser. No. 838,904, July 3, 1969, Pat. No. 3,617,039. This application Oct. 8, 1970, Ser. No. 79,290

Int. Cl. C23g *1/20*

U.S. Cl. 134—2 **20 Claims**

Chromium-containing steel is descaled by wetting the surface of the steel after annealing and while still hot with a mixed aqueous solution of caustic soda and/or caustic potash containing at least one alkali metal salt capable of forming caustic soda or caustic potash by hydrolysis or with an aqueous solution of two or more alkali metal salts which are capable of forming caustic soda or caustic potash by hydrolysis. The water of the solution is evaporated by the retained heat of the steel and the mixture of alkali metal salts is retained on the surface of the steel in an oxygen-containing atmosphere for a period sufficient to convert the scale components into water- or acid-soluble materials.

3,715,237

VARIABLE ELECTRIC CURRENT GENERATING DEVICE

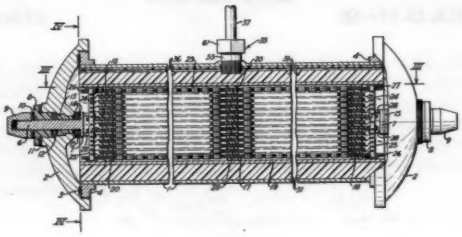
John B. Walker, 8 Earlswood Avenue, Pittsburgh, Pa.

Filed March 23, 1970, Ser. No. 21,912

Int. Cl. H01l *15/02*

U.S. Cl. 136—89 **9 Claims**

Inside a sealed case there is a photoelectric core that is sensitive to ultraviolet radiations and that is provided with a multiplicity of openings communicating with its outside. Surrounding the core and filling its openings is a radioactive self-



ionized isotopic fluid that produces ultraviolet radiations which activate the core to produce electric current.

3,715,238

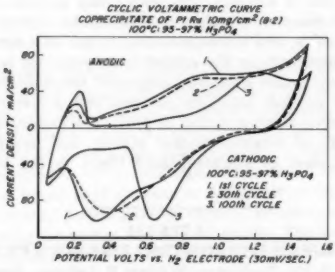
METHOD OF MAKING A POROUS CATALYTIC ELECTRODE

Jaspal Singh Mayell, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 20, 1969, Ser. No. 808,890

Int. Cl. H01m *13/04*

U.S. Cl. 136—120 FC **7 Claims**



A catalytic electrode which comprises a metal catalyst such as rhodium or ruthenium and a second metal such as platinum or palladium is improved by electrolytic treatment using repeated triangular voltage sweeps. Improvement in catalytic activity of fuel electrodes is detailed.

3,715,239

ELECTROCHEMICAL CELL CLOSURE AND METHOD OF MAKING

Douglas W. Walker, Littleton, Leland M. Gillman, Denver, and Robert E. Stark, Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

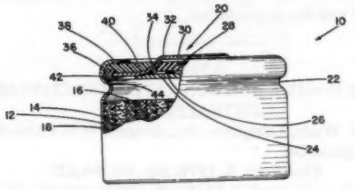
Filed Apr. 5, 1971, Ser. No. 131,236

Int. Cl. H01m *1/02*

U.S. Cl. 136—133 **14 Claims**

An electrochemical cell closure between the cell top and container is described comprising: A well formed

between the upper protruding cell container mouth and upper protruding marginal portion of the cell top; a dam of an insulating material interposed in sealing relation between the walls of the well; and sealing material poured



into the well and held by the dam sealingly bridging the cell container and top. In one embodiment, the insulating dam is made of a compressible material which is crimped inwardly prior to flowing the sealing material into the well.

3,715,240

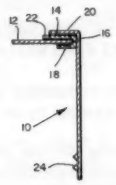
CONTACT ASSEMBLY FOR DRY CELL BATTERY

David O. Hamel, Madison, Wis., assignor to ESB Incorporated

Filed Jan. 21, 1971, Ser. No. 108,298

Int. Cl. H01m *13/10*

U.S. Cl. 136—134 P **7 Claims**



A contact assembly for connecting the terminals of a dry cell stack to the external terminals of a battery is described in which a conductive contact plate connects the top terminal of the cell stack to a first battery terminal. A connector strip nonconductively attached to the contact plate connects the bottom terminal of the stack with a second battery terminal. A method for assembling the connector assembly is also described.

3,715,241

DOPED TIN TELLURIDE BRAZING MATERIAL FOR SEMICONDUCTIVE THERMOELECTRIC GENERATOR ELEMENTS

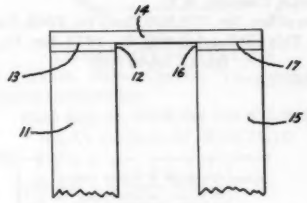
James H. Bredt, Garrett Park, Md., and Louis F. Kendall, Jr., Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1968, Ser. No. 766,634

Int. Cl. H01v *1/04*

U.S. Cl. 136—237 **5 Claims**

It has been found that when semiconductive lead telluride thermoelectric generator elements are brazed to iron clad stainless steel bridging members by stoichiometric tin telluride, there was a gradual degradation of the electrical properties during the life of the generator. It is believed that this is the result of migration of the doping elements from the lead telluride into the tin telluride by solid state diffusion. Therefore, p-type lead telluride has been brazed with sodium doped tin telluride and n-type



lead telluride has been brazed with iodine doped tin telluride.

3,715,242

METHODS OF MANUFACTURING SEMICONDUCTOR DEVICES

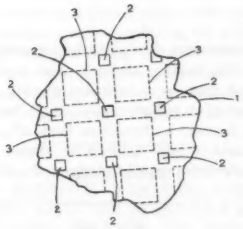
Peter James Daniel, Redhill, England, assignor to U.S. Philips Corporation

Filed Dec. 21, 1970, Ser. No. 100,152

Claims priority, application Great Britain, Dec. 17, 1969, 61,517/69

Int. Cl. H01l *7/00*; G01n *21/30*

U.S. Cl. 148—1.5 **18 Claims**



A method of manufacturing a semiconductor device in which a process is effected at a semiconductor surface with the aid of an electron beam. A reference marker of a metal or metal based layer is provided at the semiconductor surface, the secondary electron emission pattern of the marker being used for registration purposes. The reference marker remains substantially inert and adheres to the surface during the process. Where two or more processes are effected at the semiconductor surface, each with the aid of an electron beam, the metal or metal based layer reference marker provides for accurate alignment at each process. The electron beam may be used for the selective exposure of an electron sensitive resist layer or for the selective electron bombardment of a layer of an organic silicon compound which yields an adherent oxide layer pattern on the semiconductor surface and may be used as a mask against impurity diffusion.

3,715,243

SUPERCONDUCTORS

Anthony Robert King Clayton, Sutton Coldfield, and Anthony Clifford Barber, Lichfield, England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

No Drawing. Filed Apr. 27, 1967, Ser. No. 634,072

Claims priority, application Great Britain, May 4, 1966, 19,756/66

Int. Cl. C22f *1/18*

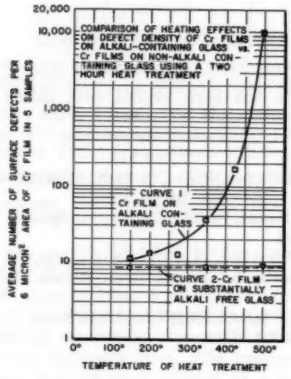
U.S. Cl. 148—11.5 R **11 Claims**

A method of making a superconductor comprises cold reduction of at least 10%, heat-treating 100° C.–500° C., at least one further cold reduction of at least 5%, and heat-treating 100° C.–500° C.

3,715,244
CHROMIUM FILM MICROCIRCUIT MASK

Raymond E. Szupillo, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 775,860, Nov. 14, 1968, Pat. No. 3,647,566. This application Aug. 26, 1971, Ser. No. 175,138
Int. Cl. B44d *1/02*
U.S. Cl. 148—31.5 **4 Claims**


20,000
10,000
1,000
100
10
1
AVERAGE NUMBER OF SURFACE DEFECTS PER 6 MICRON² AREA OF Cr FILM IN 5 SAMPLES
COMPARISON OF HEATING EFFECTS ON DEFECT DENSITY OF Cr FILMS ON ALKALI-CONTAINING GLASS vs. Cr FILMS ON NON-ALKALI CONTAINING GLASS USING A TWO HOUR HEAT TREATMENT
CURVE 1 Cr FILM ON ALKALI CONTAINING GLASS
CURVE 2-Cr FILM ON SUBSTANTIALLY ALKALI FREE GLASS
0° 100° 200° 300° 400° 500°
TEMPERATURE OF HEAT TREATMENT

Improved chromium film glass based articles having a low incidence of film surface defects, and highly hardened extremely scratch and wear resistant quality. The method includes the use of a substantially alkali-free glass substrate upon which is formed a chromium film, after which the composite so formed is heat treated to obtain the desired film hardness and electromagnetic energy reflective quality.

3,715,245
SELECTIVE LIQUID PHASE EPITAXIAL GROWTH PROCESS

Allen M. Barnett, and Simeon V. Galginaitis, both of Schenectady, N.Y., assignors to General Electric Company

Filed Feb. 17, 1971, Ser. No. 116,125
Int. Cl. H01l *7/00*
U.S. Cl. 148—171 **4 Claims**

A process for selectively growing semiconductor material, particularly Group III-V semiconductor compounds, on semi-insulating substrates with uniform dissolution and regrowth in selected regions is disclosed. The fabrication of substantially planar monolithic semiconductor devices in a semi-insulating substrate and, in particular, light-emitting devices are also disclosed.

3,715,246
PROPELLANTS DERIVED FROM CROSSLINKING OF POLYBUTADIENE ELASTOMERS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed May 12, 1970, Ser. No. 48,618
Int. Cl. C06b *11/00*
U.S. Cl. 149—19 **8 Claims**

Composite propellant compositions are disclosed which contain binders formed from polybutadiene prepolymers cross-linked by siloxane compounds. The crosslinking by siloxanes to produce propellant binders eliminates the need for end-capping polybutadiene to introduce functional groups through which crosslinking can be effected. The pertinent siloxane compounds contain two silicon hydride bonds of the types present in: 1,1,3,3-tetramethyldisiloxane, $(CH_3)_2H{\cdot}SiO{\cdot}SiH(CH_3)_2$; 1,1,1 - 3,5,7,7,7-octamethyltetrasiloxane, $(CH_3)_3{\cdot}O{\cdot}Si(H{\cdot}CH_3){\cdot}O{\cdot}Si(H{\cdot}CH_3){\cdot}O{\cdot}Si(CH_3)_3$. The prepolymers are crosslinked in a composite propellant composition to produce the propellant binder for the composition. When the crosslinking technique is used in a propellant production process which additionally employs hydroxyl-terminated polybutadiene in combination with a polyisocyanate, a propellant binder with improved mechanical properties and improved stability is produced.

3,715,247
WATER-IN-OIL EMULSION EXPLOSIVE CONTAINING ENTRAPPED GAS

Charles G. Wade, Lehighton, Pa., assignor to ICI America Inc., Wilmington, Del.

Filed Sept. 3, 1970, Ser. No. 69,433
Int. Cl. C06b *1/04*
U.S. Cl. 149—21 **16 Claims**

A water-in-oil emulsion explosive composition comprising a carbonaceous fuel, an inorganic oxidizer, a detonation sensitizer, water, an emulsifier, and a gas. The detonation catalyst is an inorganic metal compound of atomic number 13 or greater, other than Groups Ia and IIa and other than dioxides. The detonation sensitizer greatly enhances the sensitivity of the compositions so that they are cap-sensitive, the preferred compositions being cap-sensitive in a 1-inch diameter cartridge.

3,715,248
CASTABLE METALLIC ILLUMINANT FUEL CONTAINING NITROCELLULOSE PLASTICIZED BINDER

Jacob M. Swotinsky, Morris Plains; Stephen Newman, Newton, and Olindo A. Colitti, Parsippany, all of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 15, 1970, Ser. No. 98,448
Int. Cl. C06b *9/00, 15/00*
U.S. Cl. 149—39 **6 Claims**

A castable illuminant containing a particulate mixture of fuel and oxidizer held together by an energetic plastisol type binder.

A process of preparing devices containing the aforesaid composition wherein such ingredients are distributed into a viscous mass, poured directly into an end-item container, and thermally cured in a state ready for use as an illuminating device.

3,715,249
ETCHING Si_3N_4

Peter Theodore Panousis, New Providence, N.J., and Herbert Atkin Waggener, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

No Drawing. Filed Sept. 3, 1971, Ser. No. 177,840
Int. Cl. H01l *7/50*
U.S. Cl. 156—17 **3 Claims**

The specification describes a process for etching silicon nitride in the presence of silicon. It has been found that silicon, especially when highly doped, is attacked by the normal phosphoric acid etchant for Si_3N_4. The addition of H_2SO_4 to the phosphoric acid prevents the attack of silicon.

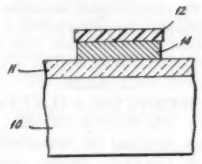
3,715,250
ALUMINUM ETCHING SOLUTION

Leonard F. Altman, Philadelphia, and Marcus Sharp, Lansdale, both of Pa., assignors to General Instrument Corporation, Newark, N.J.

Filed March 29, 1971, Ser. No. 128,896
Int. Cl. C23g *1/22*
U.S. Cl. 156—22 **7 Claims**

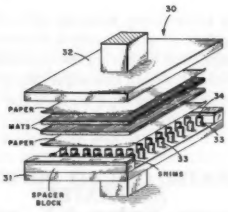
An etching bath, useful in the fabrication of hybrid thin film and silicon monolithic semiconductor devices, for removing aluminum film which is unprotected by an overlying photore-

sist. The bath includes the conventional combination of phosphoric, nitric, and acetic acids, to which is added about



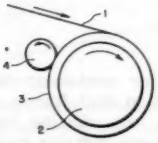
2¼ grams of sucrose per 100 ml of etch solution. Addition of the sucrose substantially reduces undercutting and improves resistance to over-etching.

3,715,251
LAMINATED NON-WOVEN SHEET
James S. Prentice, Baytown, Tex., assignor to Esso Research and Engineering Company, Linden, N.J.
Filed Oct. 9, 1969, Ser. No. 864,994
Int. Cl. B32b *17/12, 31/04*
U.S. Cl. 156—62.8 **11 Claims**



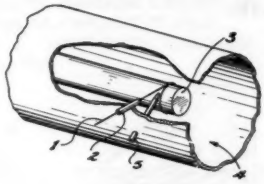
A laminated non-woven sheet is made from non-woven mats of melt-blown thermoplastic polymer fibers. The non-woven sheets may be produced by either point welding or using adhesives to laminate at least one non-woven mat having a high strip tensile strength to at least one non-woven mat having a high tear resistance so that the sheets have both high strip tensile strength and high tear resistance.

3,715,252
METHOD AND APPARATUS FOR FORMING FILAMENT-WOUND ARTICLES
Geoffrey Fairbairn, Cambridge, England, assignor to Ciba-Geigy AG, Basel, Switzerland
Filed Aug. 25, 1971, Ser. No. 174,891
Claims priority, application Great Britain, Aug. 27, 1970, 41,372/70
Int. Cl. B31c *13/00;* **B65h** *81/00;* **B05c** *11/10*
U.S. Cl. 156—162 **11 Claims**



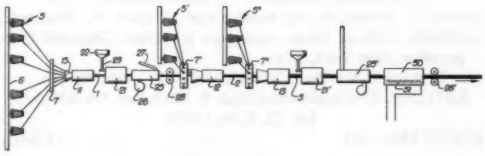
In making filament-wound articles from tape which comprises tows of fibers embedded in a resin, surplus resin is removed from the surface of the winding by contacting it with a hollow roller perforated on its surface, which rotates in the same direction as the winding and at the same speed as the winding, or slightly faster.

3,715,253
COMPOSITE MATERIALS
Eugene L. Olcott, Falls Church, Va., assignor to The Susquehanna Corporation
Filed Aug. 28, 1969, Ser. No. 870,948
Int. Cl. C01b *31/07;* **B29c** *25/10*
U.S. Cl. 156—175 **10 Claims**



A method for making shaped pyrolytic graphite articles which comprises progressively positioning continuous carbon strand onto a shaped form and simultaneously pyrolyzing carbonaceous gas onto the strand at about the point of positioning contact to nucleate pyrolytic graphite from the strand, progressively positioning additional strand laterally spaced from previously positioned strand and, as the additional strand is positioned, simultaneously pyrolyzing the carbonaceous gas on the additional strand at about the point of positioning contact and on the pyrolytic graphite nucleated from previously positioned strand to form a continuous pyrolytic graphite matrix interconnecting laterally shaped strands.

3,715,254
COMPOSITE FIBROUS WRITING INSTRUMENT ELEMENTS AND THEIR MANUFACTURE
William S. Tolgyesi, Rockville, Md., assignor to The Gillette Company, Santa Monica, Calif.
Filed Feb. 25, 1971, Ser. No. 118,897
Int. Cl. B05c *8/04;* **D02g** *3/36;* **D34k** *1/00*
U.S. Cl. 156—180 **8 Claims**



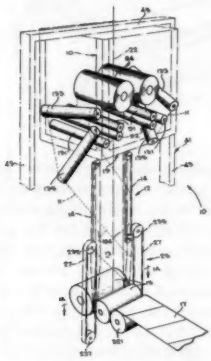
A continuous process involving the compression and bonding together, induced by heat, of virtually parallel strands of filamentary material, followed by the addition of further strands of filamentary material to the exterior surface of the previously bonded strands and further compression and bonding, whereby the strength, ability to convey liquids by capillarity and other characteristics of the continuous, porous, absorbent, elongated ultimate object are controlled. Two or more sequential compression and heat-setting or bonding steps may be employed. Various fibrous or filamentary materials may be used and their properties utilized to best advantage. Strength and resistance to load may be imparted to a minute axial portion of a writing point without impairment of necessary capillary characteristics in other areas of the point. Products having such controlled characteristics for use as reservoir fillers and writing points in writing instruments

and having desired capillary relationships therebetween as well as load-bearing properties. Writing instruments provided with products of this invention.

3,715,255
METHOD OF AND APPARATUS FOR BIAS LAYING WITH FLAT MANDREL

Charles A. Lee and Warren R. Furbeck, Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Continuation-in-part of application Ser. No. 719,986, Apr. 9, 1968. This application Dec. 7, 1970, Ser. No. 95,756
Int. Cl. B65b *17/18*
U.S. Cl. 156—189 15 Claims

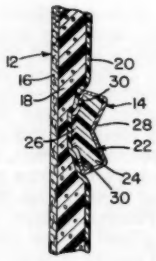


At least one web of material is spirally wound on a flat mandrel to form a tube which is transferred by means across a gap to a nip of a pair of flattening rolls. More specifically, the transfer means includes a pair of transfer belts which engage the external edges of the tube and hold the same against sagging or wracking and keep these edges moving at the same rate of travel across the gap as the tube travels on the mandrel.

3,715,256
METHOD OF MAKING AN EMBOSSED PANEL

Robert E. Truesdell, Rochester, and William H. Nienstedt, Detroit, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 530,931, March 1, 1966, Pat. No. 3,471,355. This application Sept. 8, 1969, Ser. No. 855,813
Int. Cl. B29c *19/00*
U.S. Cl. 156—244 12 Claims

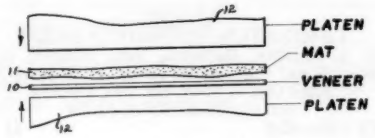


A method of making an embossed panel including dual extruding a molding strip in the form of a composite duplex structure having a plastic support member with a first heat sealable plastic layer fused thereto and disposing a second heat sealable plastic layer onto a panel backing member. The first and second heat sealable layers are disposed adjacent one another and are heat sealed and fused together to conjoin the molding strip to the second heat sealable layer such that the support member projects from the panel.

3,715,257
METHOD FOR PRODUCING A FLAT PARTICLE-FACED PLYWOOD PANEL

Jack W. Dunaway; Michael W. Woodland, and Bernard H. Johnson, all of Lewiston, Idaho, assignors to Potlatch Forests, Inc., San Francisco, Calif.

Filed Feb. 26, 1971, Ser. No. 119,188
Int. Cl. B27d *1/00*
U.S. Cl. 156—299 10 Claims

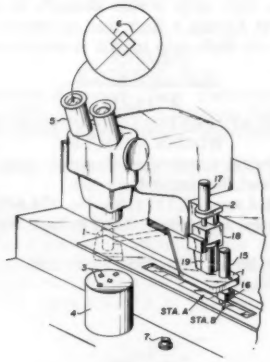


A method for minimizing warpage of a plywood assembly having a bonded face of wood particle board or similar material. This is accomplished by curing the particle board layer on a single sheet of veneer, which consequently is used in place of a conventional face veneer in a plywood layup.

3,715,258
INTEGRATED CIRCUIT DIE BONDING APPARATUS

Jeffrey B. Cunnane, Yonkers, N.Y., assignor to H. S. Bancroft Corporation, Cherry Hill, N.J.

Filed Mar. 23, 1971, Ser. No. 127,201
Int. Cl. B32b *31/20*; C09j *5/06*
U.S. Cl. 156—356 8 Claims



An apparatus for semi-automatically bonding integrated circuit dies to lead frames comprising adhesive dispensing means, die aligning means, die transport means and lead frame indexing means. In an operating cycle a metered drop of conductive adhesive is placed on a lead frame in a lead frame strip. The operator then microscopically aligns an integrated circuit die to a desired position and utilizes a vacuum arm to pick up the

die and place it on the adhesive. Simultaneously adhesive is placed on the next lead frame which is then indexed into the operative position.

3,715,259

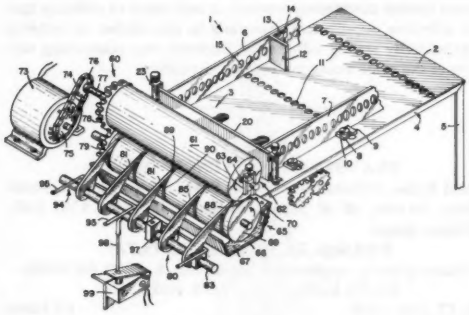
MEANS FOR APPLYING GLUE TO ARTICLES

Frank Gordon, 5 Carol Road, Marblehead, Mass. 02112

Continuation of abandoned application Ser. No. 808,750, Mar. 20, 1969. This application July 15, 1971, Ser. No. 163,029

Int. Cl. B32b *31/00*

U.S. Cl. 156—363 **4 Claims**



A machine for successively applying adhesive to sequentially fed articles, bottom fed from a stack, in which the feed of the articles to the adhesive applying means is automatically stopped when an article to which adhesive has already been applied has reached a receiving means and has not been removed by an operator.

3,715,260

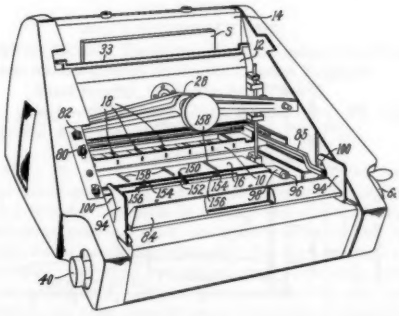
APPARATUS FOR BINDING SHEETS

Peter L. Dornemann, Needham; Milton R. Radcliff, Marblehead; Albert E. Newton, Beverly, and Samuel E. Eaton, Jr., Hingham, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Dec. 17, 1970, Ser. No. 99,002

Int. Cl. B32b *3/02*

U.S. Cl. 156—477 B **7 Claims**



Apparatus for binding a stack of sheets in which the stack is aligned on an edge to be bound and clamped in the aligned position with the edge exposed for binding. A binding tape has thermoactive adhesive arranged on one exposed side in a pattern of discrete deposits. The tape and edge are then simultaneously heated until the adhesive flows in a fluid state from the discrete deposits to cover the tape. The adhesive on the tape is then pressed against the exposed edge of the stack and wiped around stack sides adjacent the edge to bind the stack of sheets.

3,715,261

APPARATUS FOR OPENING AND MARKING THE CONTENTS OF FILM CASSETTES

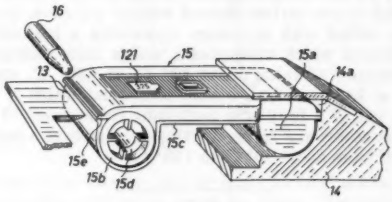
Fridolin Hennig; Hans-Jurgen Kellner; Klaus Potz, and Christian Gotze, all of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 792,288, Jan. 21, 1969, Pat. No. 3,580,443. This application Jan. 29, 1971, Ser. No. 111,032

Claims priority, application Germany, Jan. 19, 1968, P 16 22 303.3; Sept. 14, 1968, P 17 97 336.3

Int. Cl. B32b *31/10, 31/20*

U.S. Cl. 156—552 **6 Claims**



Apparatus for opening plastic housings of film cassettes has a support which can hold a housing in a predetermined position, a tool having a cutting edge which is movable against and penetrates into the housing to produce therein a crack, a mechanism for thereupon moving the tool with reference to the housing or vice versa so that the crack is propagated until the housing is sufficiently opened to permit withdrawal of the reel which carries exposed film, and an applicator for applying an identifying marker to a predetermined portion of film on the withdrawn reel.

3,715,262

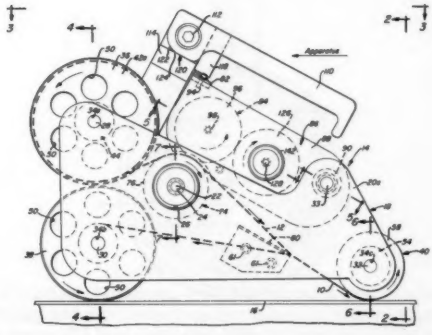
APPARATUS FOR PRINTING AND DISPENSING LABELS

Calvin E. Kelley, Franklin, Pa., assignor to United States Steel Corporation

Filed Feb. 22, 1971, Ser. No. 117,601

Int. Cl. B44c *1/24*

U.S. Cl. 156—541 **29 Claims**



An apparatus for and method of dispensing labels and a printing device for and method of printing such labels are disclosed.

3,715,263

HEAT-SENSITIVE STENCIL SHEET

Keishi Kubo, Yokohama, Kiyoshi Sakai, Tokyo, Takashi Sato, Urawa, and Itaru Nakamura, Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

No Drawing. Filed Nov. 13, 1970, Ser. No. 89,453
Claims priority, application Japan, Nov. 14, 1969, 44/91,269
Int. Cl. B44f 1/10
U.S. Cl. 161—33 10 Claims

A heat-sensitive stencil sheet comprising:

(a) A thin porous support having a thermoplastic resin film bonded to one surface thereof with an adhesive containing a heat-sensitive component which undergoes a visible color change at a temperature of from about 80° C. to 180° C. together with at least one heat-fusible compound which is a metallic salt of a fatty acid containing from about 10 to 22 carbon atoms and forms a transparent melt at a temperature of from about 50° C. to 150° C.; or

(b) A thin porous support having a thermoplastic film bonded to one surface thereof with an adhesive, said film being coated with a mixture containing a heat-sensitive component which undergoes a visible color change at a temperature of from about 80° C. to 180° C. together with at least one heat-fusible compound which is a metallic salt of a fatty acid containing from about 10 to 22 carbon atoms and forms a transparent melt at a temperature of from about 50° C. to 150° C.

3,715,264

DECORATIVE WALL COVERING

Arthur Burton, Denton, England, assignor to Imperial Chemical Industries, Limited, London, England

Filed Feb. 22, 1971, Ser. No. 117,700
Int. Cl. B32b 5/02, 27/10, 27/30, 29/02
U.S. Cl. 161—82 5 Claims

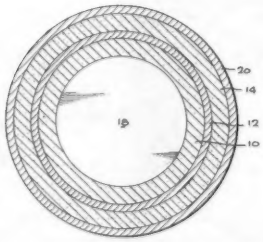
A decorative wall covering comprising a paper sheet having a decorative surface which has a continuous coating of a polymeric material thereon, the paper sheet being laminated on its other surface to an open weave fabric whereby the tendency of the covering to curl on wetting with a water-based adhesive is reduced.

3,715,265

COMPOSITE THERMAL INSULATION

Robert D. Allen, and Wayne M. Lysher, both of Richland, Wash., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Sept. 3, 1969, Ser. No. 854,932
Int. Cl. B32b 1/08, 5/16, 15/16
U.S. Cl. 161—125 16 Claims



Composite thermal insulation comprising layers of particulate material including materials having low conductivity above 1,000°C, e.g. amorphous carbon black, and materials having low conductivity below 1,000°C, e.g. zirconia, disposed alternately with one or more layers of metal sheet, e.g. tantalum foil. The first and last layers are comprised of particulate material.

3,715,266

WIRE REINFORCED RUBBER PRODUCT

Michael E. Winters, Dallas, Tex., and Wyong S. Han, Roseville, Mich., assignors to Uniroyal Inc., Detroit, Mich.

Filed Aug. 25, 1971, Ser. No. 174,985
Int. Cl. B29h 17/28
U.S. Cl. 161—140 9 Claims

In a steel wire reinforced rubber tire or other metal reinforced rubber containing product, a technique of utilizing special adhesive component materials in the rubber to achieve unexpectedly strong adherence between the contacting surfaces of the reinforcing metal and the rubber.

3,715,267

HEAT-SENSITIVE STENCIL SHEET

Keishi Kubo, Yokohama; Kiyoshi Sakai, Tokyo, and Takashi Sato, Urawa, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1970, Ser. No. 75,725
Claims priority, application Japan, Oct. 8, 1969, 44/80503
Int. Cl. B32b 27/10, 27/30; B41n 1/24
U.S. Cl. 161—165 6 Claims

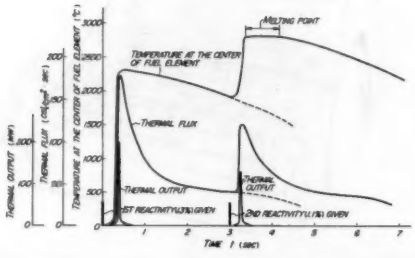
A heat-sensitive stencil sheet comprising a porous supporting sheet and a thermoplastic resin film which is bonded to one surface of the supporting sheet with an adhesive containing at least one metal salt of a higher fatty acid having from 10 to 22 carbon atoms.

3,715,268

DELIGNIFICATION OF LIGNOCELLULOSIC MATERIALS WITH A SOLUTION OF NITROGEN DIOXIDE IN ALIPHATIC HYDROCARBON SOLVENT

Frederick Bender and Louis-Philippe Clermont, Ottawa, Ontario, and Alan Warren Bowden, Prince Rupert, Canada

Filed Oct. 22, 1970, Ser. No. 81,990
Claims priority, application Canada, Oct. 24, 1969, 65,758
Int. Cl. D21c 3/16, 3/20
U.S. Cl. 162—72 11 Claims



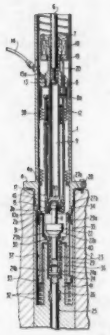
The invention relates to the delignification of cellulosic materials which are, in a first step, subjected to the action of nitrogen dioxide in an aliphatic hydrocarbon solvent to produce reaction products of nitrogen dioxide and the non-carbohydrate components. After separation of the unused

NO_2 reagent and residual solvent, the treated materials are extracted with a weak alkaline solution to remove the lignin rendered soluble by the first step.

3,715,269
CONTROL ROD DRIVE UNITS FOR NUCLEAR REACTORS

Franz Mehren, Porz-Urbach, Germany, assignor to Interatom Internationale Atomreaktorbau GmbH, Bensberg/Cologne, Germany

Filed May 21, 1969, Ser. No. 826,308
Int. Cl. G21c 7/08
U.S. Cl. 176—36 R 9 Claims



A control rod drive unit for use with nuclear reactors having a motor for effecting movement of a drive rod coupled to the control rod between positions corresponding to full insertion and full withdrawal of the control rod with respect to the reactor. There is also provided a seal for providing a gas tight sealing between the drive rod and the cover of the nuclear reactor with the motor connected to the drive rod, and a further seal for sealing the drive rod to the reactor operative upon the means for disconnecting the motor from the drive rod, and a further means for partially disengaging the first seal from the reactor cover.

3,715,270
NUCLEAR REACTORS

George Oliver Jackson, Timperley, England, assignor to United Kingdom Atomic Energy Authority, London, England

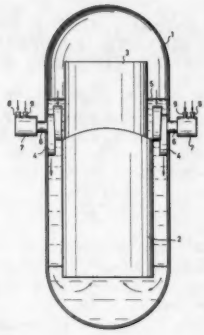
Filed Jan. 13, 1969, Ser. No. 790,779
Claims priority, application Great Britain, Jan. 30, 1968, 4,847/68; Feb. 21, 1968, 8,535/68
Int. Cl. G21c 9/00, 15/00
U.S. Cl. 176—38 6 Claims

A large power-producing nuclear reactor of the liquid metal cooled fast breeder type with its coolant circuitry submerged in a liquid metal pool in a vault, has an enclosed core and coolant circuit loops communicating with the core enclosure at opposed ends, the core enclosure also containing radial neutron shielding and one end neutron shielding and being constituted by an open-topped vessel whose top is closed by a lid which incorporates a part of neutron shielding for the other end, the remaining part of said other end neutron shielding being constituted by the vault roof or a part thereof. The vessel lid is preferably connected to a co-axial rotatable part of said vault roof for rotation and outward axial movement therewith. The reactor tank preferably has a minimum width in the region where the core is disposed so as to provide hold-down structure with minimum span.

3,715,271
BOILING WATER REACTOR PLANT

Dusan Florjancic, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed June 28, 1971, Ser. No. 157,437
Claims priority, application Switzerland, July 1, 1970, 9961/70
Int. Cl. G21c 15/24
U.S. Cl. 176—54 13 Claims

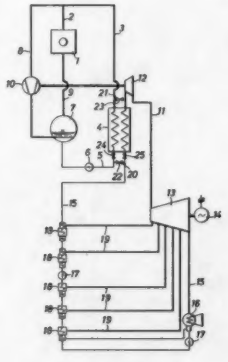


The socket serves as an inlet for feed water and as a housing for the turbine shaft which drives the pump. The socket includes a duct which delivers feed water directly into the water chamber as well as a duct for feeding the water discharged from the turbine into the water chamber via the pump.

3,715,272
METHOD OF OPERATING A NUCLEAR REACTOR FACILITY WITH A STEAM COOLED FAST BREEDER REACTOR AS THE HEAT SOURCE

Ludolf Ritz, Karlsruhe-Waldstadt, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed April 16, 1970, Ser. No. 29,232
Claims priority, application Germany, April 16, 1969, P 19 19 278.0
Int. Cl. G21b 1/02
U.S. Cl. 176—60 4 Claims



A method of operating a nuclear reactor facility in which a primary and a secondary cooling cycle are coupled together by means of a heat exchanger, with the primary cooling cycle containing a steam cooled fast breeder reactor and the secondary cooling cycle containing a working unit operated on steam which is generated and superheated in the heat exchanger. A fraction of the steam is superheated in the reac-

tor to complete condensation in the heat exchanger, and the thus produced condensate is mixed with the other fraction of the steam superheated in the reactor to produce live steam which is recycled into the reactor. The coolant for the primary cycle is either entirely or predominantly D_2O. The desuperheating and condensation of the primary coolant in the heat exchanger is performed at a pressure level slightly higher than that of the secondary coolant.

3,715,273

NUCLEAR FUEL ELEMENT CONTAINING SINTERED URANIUM DIOXIDE FUEL WITH A FINE PARTICULATE DISPERSION OF AN OXIDE ADDITIVE THEREIN, AND METHOD OF MAKING SAME

Frank Rigby, Blackpool, and John Brian Ainscough, Fulwood, England, assignors to United Kingdom Atomic Energy Authority, London, England

No Drawing. Filed Dec. 8, 1969, Ser. No. 883,315
Claims priority, application Great Britain, Dec. 16, 1968, 59,814/68
Int. Cl. G21c *3/06*
U.S. Cl. 176—67 **11 Claims**

Sintered uranium dioxide containing an additive of for example magnesium oxide or aluminum oxide, the additive being dispersed in fine particulate form within the grains of uranium dioxide.

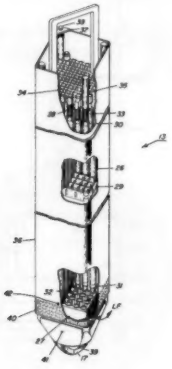
A method is also disclosed for preparing such a material in which the uranium dioxide containing the additive is sintered in an oxidising atmosphere, for example 0 to 50% hydrogen in carbon dioxide to convert the material to a hyperstoichiometric uranium dioxide in which the additive is soluble. The material is then heated in a reducing atmosphere for example of hydrogen to convert the material to stoichiometric uranium dioxide in which the additive is insoluble whereby the additive is released from solution in the material dispersed in fine particulate form within the grains of the uranium dioxide.

3,715,274

NUCLEAR FUEL ASSEMBLY WITH REINFORCED FLOW CHANNEL

Dominic A. Venier; Bart A. Smith, and James L. Lass, all of San Jose, Calif., assignors to General Electric Company

Filed Aug. 15, 1969, Ser. No. 850,486
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 **9 Claims**



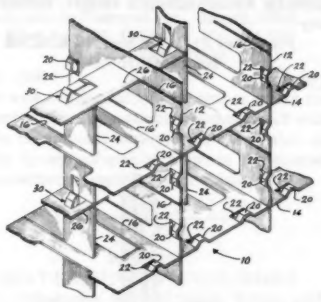
A nuclear fuel assembly wherein the lower portion of the flow channel is reinforced or stiffened in the region of its interface with the lower tie plate for improved control of bypass flow of coolant into the spaces between the fuel assemblies of a nuclear reactor.

3,715,275

BIMETALLIC SPACER GRID ARRANGEMENT

Donald M. Krawiec, Thompsonville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed March 2, 1970, Ser. No. 15,510
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 **3 Claims**



A bimetallic spacer grid arrangement for fuel element support in nuclear reactors. A matrix of spacer elements formed from a first material having characteristic low neutron capture cross section has nested therewithin a matrix of spring elements formed of a second material having better stress relaxation properties than said first material. The spring elements consist of an interconnected series of strips of the second material having integral tab-like projections protruding laterally therefrom at selected points so as to serve as fuel element biasing members.

3,715,276

ENZYMATIC METHOD FOR MANUFACTURE OF FRUCTOSE FROM GLUCOSE

Yoshiyuki Takasaki, and Akira Kamibayashi, both of Chiba, Japan, assignors to Agency of Industrial Science & Technology Govermental, Tokyo, Japan

Filed Oct. 23, 1970, Ser. No. 83,168
Claims priority, application Japan, Oct. 25, 1969, 44/85605; Oct. 25, 1969, 44/85606
Int. Cl. C13k *9/00*
U.S. Cl. 195—31 F **8 Claims**

In an enzymatic reaction for isomerizing glucose into fructose with a glucose isomerase, a method is provided for converting glucose into fructose which is characterized by using calcium carbonate, magnesium carbonate an anion-exchange resin or an amphoteric-ion exchange resin as a pH regulator.

3,715,277

PREPARATION OF FIBERS CONTAINING FIBERS

Dino S. Dinelli, Via Ramiro Fabiani 1, Donato Milanese, Italy, and Franco Cognigni, Via Villafranco 10, Cesano Maderno, Italy

No Drawing. Filed June 26, 1969, Ser. No. 836,883
Claims priority, application Italy, June 26, 1968, 18,226/68; May 8, 1969, 16,551/69
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 **16 Claims**

Filaments of polymeric material are disclosed which contain discrete cells wherein droplets of enzymatic material are contained so that the enzymatic material is protected against loss of enzymatic activity and is prevented from escaping from the filaments but is permitted to exert a high degree of enzymatic activity in the presence of a substrate. A process for producing such filaments is also described which comprises mixing an enzymatic preparation with a liquid phase comprising a

solution of a synthetic polymer, extruding the liquid phase through the orifices of a spinneret and then solidifying the polymer by removing the solvent therefrom.

3,715,278

SILICEOUS MATERIALS HAVING ENZYME-POLYMER PRODUCT ATTACHED TO SURFACE THEREOF

Robert E. Miller, Ballwin, Missouri, assignor to Monsanto Company, St. Louis Missouri

Filed Feb. 11, 1970, Ser. No. 10,655
Int. Cl. C07g 7/02
U.S. Cl. 195—63 8 Claims

Enzyme-polymer products are covalently bound to siliceous materials by siliation of the siliceous material to provide functional groups which react with functional groups in the polymer-enzyme molecule. Alternatively, the polymer is first reacted with the reactive groups of the organosilated siliceous material and the enzyme subsequently reacted with the product of this reaction. The product in either case is an insoluble enzymatically-active siliceous material in which the enzyme is covalently bound to the polymer molecule which is in turn covalently bound to the surface of the organosilated siliceous material.

3,715,279

RECOVERY OF PROTEASE VALUES FROM FERMENTATION BROTHS

Hiroyuki Suzuki; Gosaburo Shionoya; Yoshihisa Suzuki, all of Kanagawa, and Tsuneo Hirahara, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 35,258, May 6, 1970, abandoned. This application Sept. 25, 1970, Ser. No. 75,672
Claims priority, application Japan, May 22, 1969, 44/39715
Int. Cl. C07g 7/028
U.S. Cl. 195—68 8 Claims

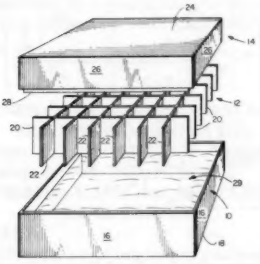
Protease values can be recovered from aqueous solutions of the same, including fermentation broths, by precipitation with isopropanol in the presence of sodium or potassium sulfate. The sulfate bearing coprecipitate is granular and directly suitable for use in detergent compositions.

3,715,280

MINI-TEST DISH

John J. Farmer, III, Bethesda, Md., assignor to the United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Filed July 14, 1970, Ser. No. 54,738
Int. Cl. C12k 1/00
U.S. Cl. 195—103.5 4 Claims



A method and apparatus for multiple test cultures having an open-topped container and a cover forming a dust-proof enclosure therewith. The container is partly filled with a culture supporting medium and a dividing member is inserted therein to divide the medium into plural open-topped test areas of equal volume. Cultures are then introduced into the various test areas to provide simultaneous multiple tests in the same support medium.

3,715,281

TRANSGROW

John E. Martin, Jr., and Arzell Lester, both of Atlanta, Ga., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Filed Oct. 23, 1970, Ser. No. 83,169
Int. Cl. C12k 1/00; C12b 3/00
U.S. Cl. 195—104 3 Claims

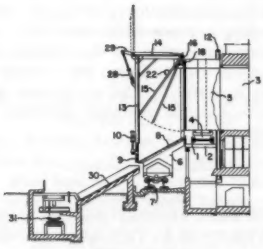
An improved transport vehicle for *N. gonorroheae* and *N. meningitidis* utilizing under a 10% CO_2 blanket, a growth medium which utilizes as essential components an improved hard agar concentration of about 2.0–2.5 percent twinned with about 0.25 percent dextrose. A diamino benzyl pyrimidine to selectively screen out *Proteus* may be added.

3,715,282

COKE CAR WITH FUME-COLLECTING HOOD

Erich E. Pries, Bochum, Karl Errgang, Bochum-Langendreer, and Friedrich-Wilhelm Drebes, Bochum-Dahlhausen, Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Mar. 22, 1971, Ser. No. 126,832
Claims priority, application Germany, Mar. 23, 1970, P 20 13 848.1
Int. Cl. C10b 27/00
U.S. Cl. 202—263 8 Claims



A tubular coke guide is disposed between the front of a battery of coke ovens and a car that receives coke discharged from the ovens through the guide. Above the car there is a fume-collecting hood, the side of which adjacent the coke guide is formed from a plurality of plates pivotally suspended from their upper ends on a horizontal axis in edge-to-edge relation. As the car is moved along the battery of ovens, each plate in succession, as it comes opposite the outlet of the coke guide, is swung inwardly to permit coke to be discharged from the guide into the car. The fume that is produced in the hood by the coke is drawn out by an exhaust system and rendered non-polluting before it is delivered to the atmosphere.

3,715,283

PROCESS FOR DISTILLING BENZYL CHLORIDE OR MIXTURES CONTAINING BENZYL CHLORIDE

Walter Bockmann, Krefeld-Uerdingen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 22, 1970, Ser. No. 100,847
Int. Cl. B01d 3/34; C07c 25/14
U.S. Cl. 203—6 5 Claims

The invention relates to an improved process for distilling benzyl chloride or mixtures containing benzyl chloride, which

is carried out in the presence of a lactam, appropriately in an amount of between about 0.01 and about 1 percent by weight.

3,715,284

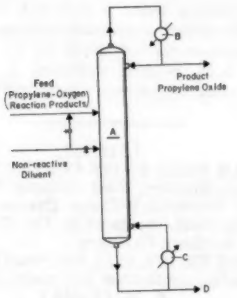
RECOVERY OF PROPYLENE OXIDE FROM CONTAMINANTS BY DISTILLATION IN THE PRESENCE OF ACETONE OR ACETONE-METHANOL MIXTURES

Simon Pierce Burns, Austin, and Henry Edmund Hartman, Conroe, both of Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Sept. 16, 1970, Ser. No. 73,218

Int. Cl. C07d *1/08*; B01d *3/34*

U.S. Cl. 203—56 **4 Claims**



Propylene oxide may be efficiently separated from contaminants present in the propylene/oxygen reaction effluent by adding a liquid boiling between 35°C and 100°C, which is not reactive with propylene oxide, to the reaction effluent and distilling propylene oxide from the resulting mixture. Propylene oxide is useful for the production of petroleum demulsifiers, surface active materials, urethane polyols and propylene glycols.

3,715,285

PROCESS OF ELECTRODEPOSITING MAGNETIC METAL LAYER ON ELECTRICALLY CONDUCTIVE SUBSTRATE

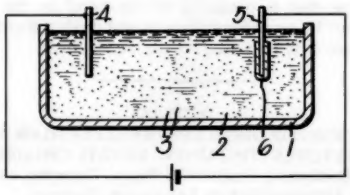
Noriyuki Tsuchiya, and Katsutoshi Amari, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 27, 1970, Ser. No. 58,594

Claims priority, application Japan, July 28, 1969, 44/59486

Int. Cl. C23b *7/02*, *7/00*; G11b *5/42*

U.S. Cl. 204—12 **7 Claims**



A process of electrodepositing a magnetic metal layer on an electrically conductive substrate in an electrolytic cell containing one salt of the magnetic metal and a fine ferrite powder. The electrodeposited magnetic metal layer formed on the substrate of the cathode contains a fine ferrite powder dispersed therein.

3,715,286

ELECTROREFINED NICKEL OF CONTROLLED SIZE

Burton Bower Knapp, Allendale, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 683,801, Nov. 17, 1967, Pat. No. 3,577,330, which is a continuation-in-part of Ser. No. 338,309, Jan. 17, 1964, abandoned. This application March 11, 1971, Ser. No. 123,436

Int. Cl. C23b *7/02*; C22d *1/14*; B01k *1/00*

U.S. Cl. 204—12 **1 Claim**

An improved process for producing electrorefined nickel cathode material of controlled dimension and substantial thickness wherein the nickel is deposited upon a substantially flat, permanent metal cathode mandrel such as stainless steel, and having conductive islands of controlled size defined on the surface thereof, e.g., by the use of interconnecting lines of nonconductive resist, from a nickel electrorefining catholyte containing controlled amounts of sulfur dioxide and a leveling agent to facilitate adherence of the electrodeposited nickel upon the mandrel surface by controlling the stress level therein to a tensile value not exceeding about 6,000 pounds per square inch and thereafter stripping the nickel deposit from the mandrel to recover electrodeposited nickel in sizes corresponding to the original areas of the conductive islands and to recover the mandrel in a condition suitable for further plating.

3,715,287

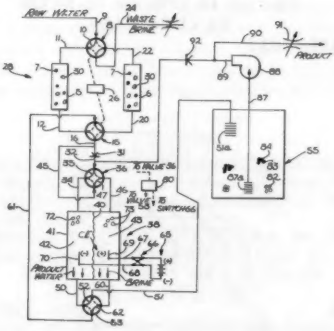
ION EXCHANGE DEMINERALIZING SYSTEM

Allan M. Johnson, Reseda, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.

Filed Jan. 21, 1971, Ser. No. 108,305

Int. Cl. B01d *15/04*, *15/06*

U.S. Cl. 204—301 **4 Claims**



A preconditioner which is used for treating raw water before utilization in a water treatment or utilization process and which receives the concentrated waste water returning from the process. The preconditioner has two tanks which can contain either a permeable, strong acid cation exchanger or a permeable, weak acid resin or both. The tanks are connected in a push-pull arrangement, i.e., one tank receives the incom-

ing raw water and the waste water leaves through the other tank. The strong acid cation exchanger in a preconditioner serves to presoften the water and the weak base anion exchanger in a preconditioner serves to add acid to the incoming water. The high salinity return water from the treatment or utilization process is discharged through the other tank to regenerate the preconditioner substance.

A storage tank-salinity buffer combination receives the product water from a demineralizing unit and the tank contains a mixture of anion and cation responsive materials and a weak base material. The mixture of anion and cation responsive materials serves to soften the product during high demand periods and the weak base serves to remove acid during the same periods. During the off supply periods, the weak base releases acid to help regenerate both the preconditioner and cation responsive storage material and the mixture of cation and anion responsive materials releases salt to the product water which is then removed. The preconditioner and storage tank-salinity buffer combination can be utilized with different types of demineralization units.

3,715,288

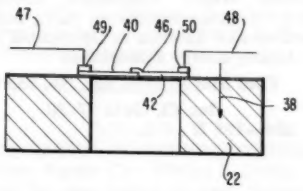
METHOD OF FABRICATING FILM-TYPE SENSING STRUCTURES

Ojars Risgin, Grass Lake, Mich., assignor to Sensors, Inc.

Filed Nov. 10, 1970, Ser. No. 88,369

Int. Cl. C23b *9/02*; C23f *17/00*; C23b *3/10*

U.S. Cl. 204—38 A **19 Claims**



A unique film-type, radiation sensing structure and method of manufacture in which a high strength, electrically insulating, thin, support film having low heat capacity and low heat conductivity is formed so as to be unitary with a backing material by selective anodizing of an aluminum blank and etching away aluminum backing. The thin film can be heated to permit the type of vapor deposition which makes practicable use of semi-conductor radiation sensing materials e.g. to form a hot junction of a thermocouple. A novel conically shaped cavity film support provides ideal absorber structure.

3,715,289

BRIGHTENER COMPOSITION FOR ACID COPPER ELECTROPLATING BATHS

Richard P. Cope, Jr., New City, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,602

Int. Cl. C23b *5/18*

U.S. Cl. 204—52 R **4 Claims**

There is disclosed a novel brightener composition for aqueous, acid copper electroplating baths comprising a combination of an ethylene oxide adduct of 2,4,7,9-tetramethyl-5-decyne-4,7-diol; disodium 2,7-dihydroxy-4,5-dithiaoctane-1,8-disulfonate monohydrate; and, 2-mercaptopyridine. The use of this brightener composition if found to provide bright, leveled ductile copper deposits from an acid copper electrolyte.

3,715,290

METHOD AND APPARATUS FOR PREPARATION OF ALUMINIUM COAGULATING AGENT

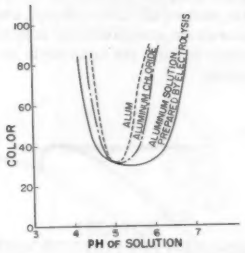
Zenzo Yokozeki, and Takeshi Hatta, both of Yokohama-shi, Japan, assignors to Kurita Water Industries Ltd., Osaka-shi, Japan

Filed Nov. 25, 1969, Ser. No. 879,741

Claims priority, application Japan, Sept. 11, 1969, 44/72134; Sept. 11, 1969, 44/72135; Sept. 16, 1969, 44/73351; Sept. 17, 1969, 44/87695

Int. Cl. B01k *1/00*

U.S. Cl. 204—96 **5 Claims**



A coagulating agent for use in water treatment is prepared by subjecting a solution to electrolysis between electrodes, at least one of which consists of aluminum as the anode. The solution contains a strongly electrolytic salt and a strong acid, in which aluminum dissolves by electrolysis.

3,715,291

METHOD OF RECOVERING SILVER FROM WASTE SILVER SOLUTIONS

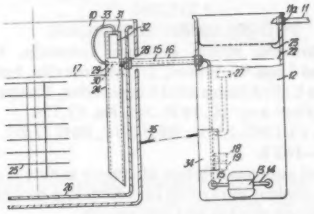
James Sydney Bentley, London, England, assignor to Photographic Silver Recovery Limited, London, England

Filed Sept. 9, 1970, Ser. No. 70,644

Claims priority, application Great Britain, Sept. 11, 1969, 44,978/69; April 16, 1970, 18,288/70

Int. Cl. C22d *1/12*; B01r *3/00*

U.S. Cl. 204—109 **9 Claims**



The recover of silver from waste silver solutions, especially spent photographic processing liquids, is effected with a silver recovery machine, such as a rotating cathode machine, and an auxiliary tank installed immediately upstream of the silver recovery machine to receive the silver waste solution from film processing equipment or other source. A metering pump delivers the waste solution from the auxiliary tank to the silver recovery machine, the pump being started and stopped in dependence upon changes in the level of the waste solution in the auxiliary tank. The silver recovery machine is arranged to operate only while the metering pump is running, this operation being at a constant current setting.

3,715,292

METHOD FOR DEOXIDIZING AND DESCALING FERROUS METALS

Theophil J. Wieczorek, West Haven, Conn., assignor to Enthone Inc., West Haven, Conn.

Division of Ser. No. 816,089, April 14, 1969, Pat. No. 3,666,667. This application Sept. 8, 1971, Ser. No. 178,836
Int. Cl. C23b 1/04
U.S. Cl. 204—145 R 7 Claims

The electrolytic removal of oxides of iron, such as rust and/or scale, from the surfaces of ferrous metals is materially accelerated by incorporating a minor amount of elemental sulfur into the alkaline cyanide-free aqueous electrolyte also containing a complexing agent capable of complexing iron ions into soluble form, and an alkaline material, and having a pH of above 10. Concentrate compositions adapted to be mixed together with water to form the electrolyte are also embodied within the invention.

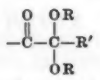
3,715,293

ACETOPHENONE-TYPE PHOTOSENSITIZERS FOR RADIATION CURABLE COATINGS

Michael Ray Sandner, and Claiborn Lee Osborn, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,066
Int. Cl. C08d 1/00; C08f 1/16
U.S. Cl. 204—159.14 4 Claims

Acetophenone compounds have been found useful as photosensitizers in radiation curable coating compositions. The novel photosensitizers of this invention contain the structural group



in which R is an alkyl or aryl group and R′ is hydrogen, alkyl, aryl, or cycloalkyl.

3,715,294

PHOTOCHEMICAL PROCESS

George L. Browell, Mount Lebanon Township, Allegheny County, and Leon W. Wilson, Jr., Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1970, Ser. No. 62,720
Int. Cl. C07c 25/04; B01j 1/10; B01l 11/00
U.S. Cl. 204—163 R 5 Claims

An acidified aqueous solution of copper sulfate is used as a combination coolant-ultraviolet light filter in a process for the photochlorination of alkyl-aryl compounds.

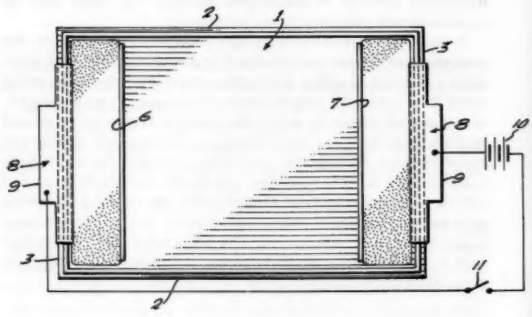
3,715,295

DISPOSABLE ELECTROPHORESIS UNIT

Paul M. Tocci, Miami, Fla., assignor to TLC Corporation, Miami, Fla.

Filed Sept. 2, 1971, Ser. No. 177,284
Int. Cl. B01k 5/00
U.S. Cl. 204—180 G 10 Claims

This invention relates to an expendable electrophoresis test unit for particle separation in a buffered system using direct current. The buffer is in semi-solid form which can be prepackaged with the unit, or dispensed from a tube at the time of use. The semi-solid buffer is prepared by mixing a liquid buffer solution with a thickening agent, preferably



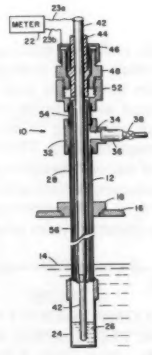
fumed silica. The unit itself is made of inexpensive disposable materials.

3,715,296

ELECTROCHEMICAL CARBON ACTIVITY METER

Francis J. Salzano, Patchogue, N.Y., Michael R. Hobdell, Gloucestershire, England, and Bertram Minushkin, Smithtown, Walter Kalinowski, Brookhaven, and Leonard Newman, Smithtown, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed May 6, 1970, Ser. No. 35,099
Int. Cl. G01n 27/30
U.S. Cl. 204—195 R 4 Claims

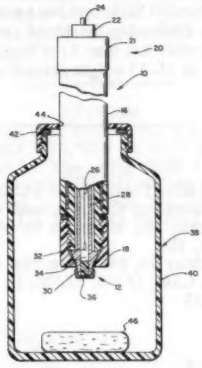


An electrochemical cell for measuring the chemical activity and concentration of carbon present in a sodium system. The cell consists of an electrode immersed in an electrolyte of Na_2CO_3 and Li_2CO_3 contained within a thin iron wall cup which is placed within the sodium. The amount of voltage generated is related to the carbon content of the sodium and the ability of sodium to carburize or decarburize various steels.

3,715,297
METHOD AND MEANS FOR EXTENDING LIFE OF ION SENSING ELECTRODE

Richard E. Cosgrove, Los Angeles; Irwin H. Krull, and Charles A. Mask, both of Garden Grove, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 20, 1970, Ser. No. 56,509
Int. Cl. G01n 27/46
U.S. Cl. 204—195 M 32 Claims

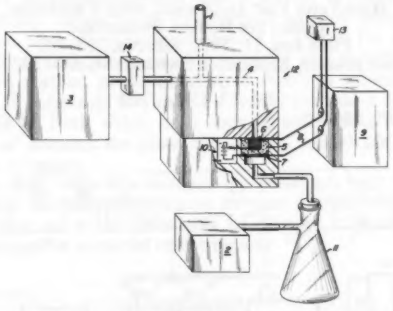


Method and means for extending the useful life of an electrode utilized for measuring the ion concentration or activity of solutions. The electrode embodies an ion sensitive barrier containing a macrocyclic compound, mineral oil, preferably an aromatic component, and a sufficient amount of a compound lipid to render the barrier substantially solid. The life of the electrode is extended by subjecting the ion sensitive barrier, during storage or non-use of the electrode, to the vapors of an aromatic component, preferably a phenylether.

3,715,298
AIR POLLUTION MONITORING SYSTEM

Louis H. Goodson, Kansas City; William B. Jacobs, Independence, both of Mo., and Andrew W. Davis, Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 22, 1970, Ser. No. 100,741
Int. Cl. G01n 27/28
U.S. Cl. 204—195 B 11 Claims

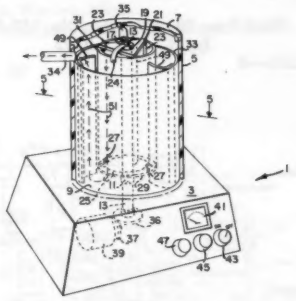


A system and method for continuous monitoring of an airstream for the presence of pollutants therein by effective absorbtion of the pollutants in an absorbing solution by creating turbulent flow of the airstream and the absorbing solution prior to passing the absorbing solution containing the pollutants to an electrochemical cell whereby any electrical change produced in the electrodes of the electrochemical cell denotes the presence of pollutants; any electrical change being proclaimed by conventional means.

3,715,299
ELECTROPLATING APPARATUS INCLUDING MEANS TO DISTURB THE BOUNDARY LAYER ADJACENT A MOVING ELECTRODE

Ralph Anderson, Saratoga, and Rodney B. Beyer, Sunnyvale, both of Calif., assignors to Future Systems, Inc., Los Gatos, Calif.

Filed Oct. 12, 1970, Ser. No. 79,827
Int. Cl. C23b 5/68
U.S. Cl. 204—212 8 Claims

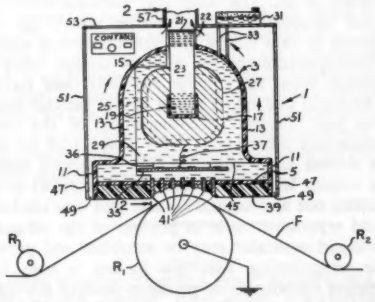


Apparatus for transfer of mass, e.g. metallic ions to or from a relatively stationary body from or into a moving fluid. Means are included for continuously disturbing the fluid about the surface of the body to discourage the establishment of a steady state boundary layer of the fluid.

3,715,300
ELECTRICAL DISCHARGE APPARATUS

Ralph L. Williams, 3609 Manhattan, Maplewood, Mo. 63143

Filed Sept. 10, 1971, Ser. No. 179,454
Int. Cl. B01k 1/00
U.S. Cl. 204—312 14 Claims



Electrical discharge apparatus includes an electrode, a housing of dielectric material enclosing the electrode and a transformer having its secondary winding connected to the electrode. The housing is filled with a high strength dielectric fluid such as oil. To enable the secondary winding to utilize the insulating properties of the dielectric fluid in the housing, and at the same time providing adequate cooling for the transformer core and primary winding and to facilitate changing frequency by changing the core and primary winding, the housing wall structure has a tubular portion going through the housing and one leg of the laminated core passes through the tubular wall, with the remainder of the core outside the housing, and the secondary winding is wound on the tubular wall portion within the housing, while the primary winding is wound on an end of the tubular wall portion projecting

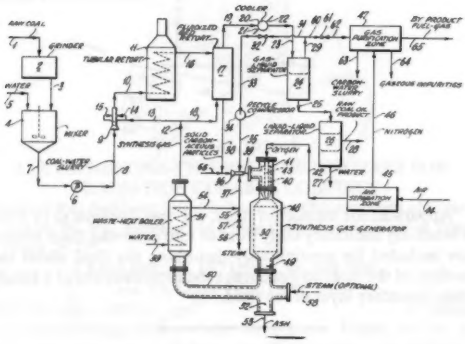
from the housing. The housing includes a faceplate of dielectric material, spaced from the electrode and including a plurality of parallel conductive bars embedded in the material each with both of its edges exposed on respectively opposite sides of the faceplate, to insure dispersal of the charge produced on the electrode.

3,715,301

MULTI-HYDROTORTING OF COAL

Joseph P. Tassoney, Whittier, and Warren G. Schlinger, Pasadena, Calif., assignors to Texaco Inc., New York, N.Y.

Filed June 30, 1971, Ser. No. 158,348
Int. Cl. C10g *9/02*
U.S. Cl. 208—8 **8 Claims**



A noncatalytic multi-hydrotorting process for maximizing the conversion of coal into coal oil. A pumpable coal-water slurry in admixture with a stream of synthesis gas is passed through a tubular retort where it is heated to a temperature in the range of about 600 to 950° F. in the absence of air. The solid coal particles are fragmentized and carbonized in the tubular retort, the volatile constituents in said slurry are volatilized and simultaneously hydrogenation of the process stream takes place. The effluent from the tubular retort is then introduced into a fluidized bed retort along with a second stream of synthesis gas. Thermal decomposition of the carbonaceous materials takes place in the absence of air and the process stream is hydrogenated for a second time. The process stream leaving the fluidized bed retort is cooled to condense out and separate water and raw coal-oil in a gas-liquid separation zone. A portion of the off-gas from the gas-liquid separator may be scrubbed and purified to produce nonpolluting fuel gas having a high heating value. Spent carbonaceous particles leaving the fluidized bed retort and optionally a portion of the off-gas from the gas-liquid separator are introduced into a free-flow noncatalytic gas generator for conversion into preferably hydrogen-rich synthesis gas by partial oxidation for use in the aforesaid two hydrotorting stages.

3,715,302

REFRIGERATION OIL COMPOSITION HAVING WIDE BOILING RANGE

Ivor W. Mills, and John J. Melchiore, Marcus Hook, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Aug. 12, 1970, Ser. No. 63,303
Int. Cl. C10g *41/00*
U.S. Cl. 208—14 **9 Claims**

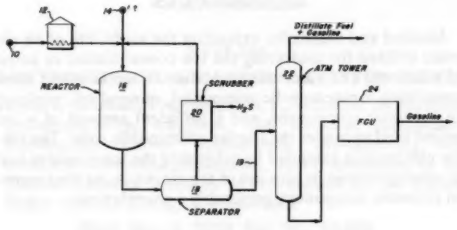
A wide boiling range e.g., for a given VGC) refrigeration oil, having good chemical and thermal stability and good miscibility with fluorinated hydrocarbon refrigerants, comprises a blend of from 50–75 volume percent of hydrorefined naphthenic oil component and 50–25 volume percent of solvent refined and dewaxed paraffinic oil component. Preferably, the hydrorefined naphthenic oil component (which can be a blend of two or more hydrorefined oils) has an SUS viscosity at 100° F. in the range of 75–750 SUS and the paraffinic oil component (which can be a blend) is chosen so that the resulting naphthenic paraffinic blend has a viscosity at 100° F. in the range of 100–500 SUS (preferably 125–300 SUS, typically 150–250 SUS) and has a maximum natural floc point of −35° F. Preferably the blend contains less than 10 ppm (more preferably less than 5) of basic nitrogen and contains in the range of 15–35 weight percent aromatics.

3,715,303

HYDROTREATMENT OF FOSSIL FUELS

Arnold N. Wennerberg, Chicago, and Alvin W. Frazier, Chicago Heights, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 18, 1971, Ser. No. 144,472
Int. Cl. C10g *13/06, 37/06;* B01j *11/06*
U.S. Cl. 208—112 **12 Claims**



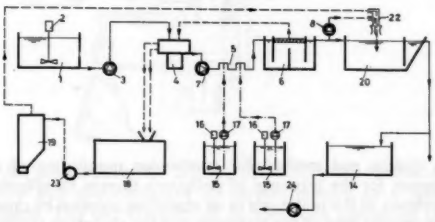
A fossil fuel including polynuclear aromatics is hydrotreated at elevated temperatures and pressures and in the presence of hydrogen by contacting said fuel with a catalyst comprising activated carbon and an alkali metal component or an alkaline earth metal component or both.

3,715,304

METHOD OF CONTROLLING THE TEMPERATURE IN A SEWAGE TREATMENT SYSTEM, AND APPARATUS THEREFOR

Hans-Peter Karl Hefermehl, 1803 Chardonne, Chalet des Roches, Switzerland

Filed Jan. 11, 1971, Ser. No. 105,476
Claims priority, application Switzerland, Jan. 13, 1970, 367/70
Int. Cl. C02c *1/02*
U.S. Cl. 210—3 **10 Claims**



Method and apparatus for controlling the temperature in a biological breakdown system, such as sewage treatment, wherein hot gas and/or steam is added to the system to maintain the proper temperature.

3,715,305

PROCESS FOR INCREASING SEDIMENTATION RATE OF HETEROGENEOUS COLLOIDAL SUSPENSION SYSTEMS

Joseph J. Carnes, Stamford; James H. Green, and John H. Heller, both of Wilton, all of Conn., assignors to The New England Institute, Inc., Ridgefield, Conn.

Filed Jan. 22, 1971, Ser. No. 109,038
Int. Cl. B01d *17/00*
U.S. Cl. 210—19 9 Claims

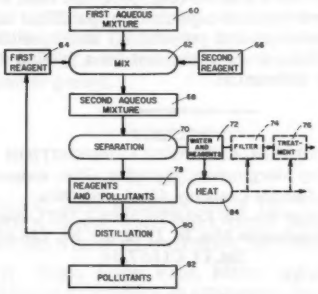
A process for increasing the sedimentation rate of heterogeneous colloidal suspension systems comprises the step of subjecting the system to an electromagnetic field in the radio frequency range.

3,715,306

PROCESS FOR SEPARATING WATER FROM POLLUTANTS IN WATER

Michael W. Mar, 2316 20th Ave. S., Seattle, Wash. 98144

Filed Jan. 4, 1971, Ser. No. 103,649
Int. Cl. B01d *11/00*
U.S. Cl. 210—21 38 Claims



The industrial processes produce many waste products. These waste products are often discharged into water and are carried away as pollutants in the water. These pollutants may be harmful to the water supplies and the animal life and plant life living in the water.

I have developed a method using a heterocyclic compound containing nitrogen and a solvent selected from the group consisting of an aromatic halogen compound and an aliphatic halogen compound to extract the pollutant from an aqueous mixture of water and pollutants.

This method produces a water which is substantially free of pollutants and may be discharged into a stream, a lake of fresh water, or a body of soft water, without fear of harming the plant life and the animal life in the body of water.

Further, with this method, the pollutants may be reused in the industrial process or may be used as a preservative or as an insecticide or may be collected and discharged in a special refuse region.

3,715,307

TREATMENT OF WATER USED IN HEAT TRANSFER EQUIPMENT

Dwight Johnson, Minneapolis, and William G. Mizuno, St. Paul, Minn., assignors to Economics Laboratory, Inc.

No Drawing. Filed June 24, 1971, Ser. No. 156,530
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 4 Claims

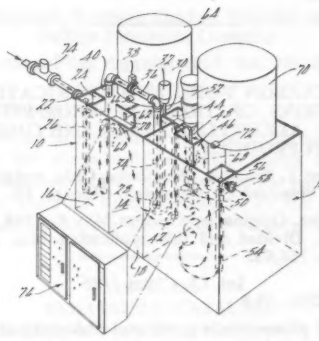
Maleic anhydride copolymers (e.g., copolymerized with vinyl acetate) are used in additive amounts in water (e.g., sea water) to reduce maintenance problems associated with the use of such water in heat transfer equipment (e.g., evaporators).

3,715,308

APPARATUS AND PROCESS FOR TREATING TOXIC WASTE MATERIALS

Andrew N. Sulfaro, Sterling Heights, and Alfred H. Stein, Southfield, both of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Filed June 4, 1971, Ser. No. 149,964
Int. Cl. C02c *5/02*
U.S. Cl. 210—60 10 Claims



An apparatus and method for continuously treating and destroying toxic constituents in effluent waste streams from metal finishing processes such as aqueous rinse solutions containing dissolved hexavalent chromium and cyanide compounds present in concentrations which are lethal to marine ecology. The apparatus and process provide for a two-stage treatment of such waste streams which are continuously recirculated in each stage and their chemical characteristics are continuously monitored and adjusted so as to assure optimum conditions for promoting the desired chemical reactions for effecting a destruction of the toxic constituents and assuring that the effluent continuously discharged from the treating apparatus is devoid of any harmful constituents.

3,715,309

PROCESS FOR DETOXICATING WASTE WATERS CHARGED WITH ORGANIC CYANIDE IMPURITIES

Jean-Pierre Zumbrunn, Lyon, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,227
Claims priority, application France, Jan. 29, 1970, 7003085
Int. Cl. C02b *1/34*
U.S. Cl. 210—63 13 Claims

A process for detoxicating waste waters which contain organic cyanide impurities, particularly nitriles consists in rapid degradation of the nitriles into amides and then into salts of organic acids by treatment with hydrogen peroxide in alkali medium, and the per compounds.

This process, which has the advantage of saturating the effluents with oxygen, permits the total purification to a residual content lower than 0.5 p.p.m. of any effluent

coming from chemical synthesis plants, such as the factories for the production of plastic materials or synthetic fibers, and containing organic nitriles.

3,715,310

FIRE-RETARDANT COMPOSITIONS

Edward Peter Butcher, Birmingham, England, assignor to Bakelite Xylonite Limited, London, England

Filed July 17, 1968, Ser. No. 745,388
Int. Cl. C09k *3/28*
U.S. Cl. 252—8.1 3 Claims

A fire-retardant composition comprising (a) a halogen-substituted aromatic hydroxy compound and (b) a phosphorus- or antimony-containing compound, for instance, a bromophenol and an aromatic phosphate, is especially well suited for incorporation, conveniently in a resin varnish, into laminates.

The resulting laminates are particularly useful for electrical applications.

3,715,311

HYDROCARBON FUEL AND LUBRICATING OIL SOLUTIONS OF TRIALKYL PHOSPHITE-LONG CHAIN ALKENYLSUCCINIC ANHYDRIDE REACTION PRODUCT

William T. Brannen, West Lake, Ohio, assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Original application May 8, 1969, Ser. No. 823,176. Divided and this application June 30, 1971, Ser. No. 158,635
Int. Cl. C10m *1/46*
U.S. Cl. 252—49.8 5 Claims

Trialkyl phosphites, e.g. tributyl phosphite, are reacted with alkenyl hydrocarbon-substituted succinic anhydrides, in which the alkenyl hydrocarbon contains at least 30 carbon atoms, to obtain reaction products which are useful as additives in hydrocarbon fuels and in lubricating oils.

3,715,312

PRODUCT

Ford C. Teeter, Palos Heights, Ill.; David B. Sheldahl, Griffith, Ind., and Carle W. Highberg, Newark, N.J., assignors to Atlantic Richfield Company, New York, N.Y. and Super Cut Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 798,472, Aug. 16, 1968, abandoned, which is a division of Ser. No. 480,492, Aug. 17, 1965, Pat. No. 3,453,784. This application Aug. 26, 1970, Ser. No. 67,291
Int. Cl. C10m *3/20, 3/02*
U.S. Cl. 252—49.5 8 Claims

Emulsifiable compositions are obtained consisting essentially of defined amounts of a long chain fatty acid partial ester of hexitol anhydride, a polyoxyethylene derivative of hexital anhydride partial long chain fatty acid ester, an alkylaryl polyether alcohol having a short polyether chain, and normally liquid oil of lubricating viscosity. These emulsifiable compositions can also contain minor amounts of lard oil and a light petroleum fraction, such as kerosene. A small amount of the emulsifiable composition, such as about 1 to 4 weight percent, is dispersed in water and forms a stable emulsion which is useful as a lubricant in grinding of glass with a diamond grinding surface. These new compositions are characterized by the ability to form and maintain oil-in-water emulsions which are stable for extended periods of time under severe conditions of use and increase diamond life, with small, economical amounts of lubricant being consumed. Other advantages are that the lubricating compositions of this invention require less spindle power with less pressure to obtain the same glass surface finish.

3,715,313

TRACTION TRANSMISSION CONTAINING LUBRICANT COMPRISING GEM-STRUCTURED POLAR COMPOUND

Marcus W. Haseltine, Jr., Brookhaven, and Gary L. Driscoll, Boothwyn, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 17, 1971, Ser. No. 144,165
Int. Cl. C10m *1/20*
U.S. Cl. 252—52 10 Claims

Polar compounds containing a gem-structured hydrocarbon "backbone" are useful as traction fluids or as components of traction fluids. For example, compositions, useful as additives to lubricants (e.g., components of traction fluids), are produced by ozonolysis of polyolefins, particularly of polyisobutylene oligimers containing at least one pair of maximally crowded geminal methyl groups. For example, ozonolysis of the novel polyisobutylenes can produce oxygenated derivatives (ketones, esters, acids, aldehydes, alcohols, etc.) which are useful as components of traction fluids. One such alcohol is 1,1,3,3,5,5,7,7-octamethyl-1-octanol. Other compounds are 4,4,6,6,8,8-hexamethyl - 2 - nonanone and 2,2,6,6,8,8-hexamethyl-4-nonanone. Blends of the ketones or of mixtures of the acids and ketones with a base oil (e.g., paraffinic lube, naphthenic lube, a hydrogenated naphthenic or paraffinic lube, polyolefins or hydrogenated polyolefins) are especially useful as traction fluids or as a lubricant for a friction drive or a limited slip differential.

3,715,314

SCOURING CLEANSER COMPOSITION

Arthur Stanley Morgenstern, Wyoming, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 130,859, April 2, 1971, abandoned. This application May 25, 1972, Ser. No. 256,684
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 12 Claims

An abrasive scouring cleanser composition consisting essentially of a water-insoluble siliceous abrasive material; an alkali metal carbonate; a water-soluble organic detergent; and calcium oxide or hydroxide. Compositions exhibiting desirable cleansing and scouring properties and effective in the removal of smears or deposits of soft metals such as aluminum or porcelain or ceramic surfaces are described.

3,715,315

BIS-(PHENOXYPHENYL) CARBONATES

Walter Traber, Riehen, and Anton G. Weiss, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 747,792, July 26, 1968, Pat. No. 3,592,837. This application Dec. 30, 1970, Ser. No. 102,992
Int. Cl. C11d *3/48*
U.S. Cl. 252—106 12 Claims

Detergents containing as an anti-bacterial additive, a bis-(phenoxyphenyl) carbonate which is unsubstituted or substituted in one or several of its benzene rings by halogen, lower alkyl or trifluoromethyl.

3,715,316

REACTOR SAFETY SPRAY SOLUTION BASE-BORATE

Benadetto A. Soldano, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 28, 1971, Ser. No. 110,765
Int. Cl. B01d *47/106*
U.S. Cl. 252—188 2 Claims

A nuclear reactor safety spray solution comprising an aqueous basic borate solution containing up to 1 volume percent

sodium thiosulfate and an effective quantity of a metal salt which enhances the reaction rate of said solution with an organic iodide such as methyl iodide in contact with said solution, in comparison to the reaction rate between said iodide in contact with a solution which does not contain a rate-accelerating concentration of said salt.

3,715,317

SOLVENT EXTRACTION PROCESS FOR PRODUCING LOW-NITRATE AND LARGE-CRYSTAL-SIZE PuO_2 SOLS

Milton H. Lloyd and Othar K. Tallent, Oak Ridge, and Rex E. Leuze, Lenoir City, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed June 2, 1971, Ser. No. 149,357

Int. Cl. C01g *56/00*

U.S. Cl. 252—301.1 S **7 Claims**

Low-nitrate plutonia sols having a NO_3/Pu mole ratio in the range 0.1 to 0.4 with average crystallite diameters of 30 to 80 A. can be produced when a sol is prepared by solvent extraction of a plutonium nitrate seeded with a plutonia sol. When the seeded sol is taken to dryness and heated for 10 to 120 minutes at a temperature in the range 190–230° C., nitrate removal occurs with concomitant crystallite growth.

3,715,318

FLUIDIZED BED PRODUCTION OF URANIUM MONOCARBIDE AND URANIUM MONOCARBIDE-URANIUM ALUMINIDE MIXTURES

George W. Hogg, Idaho Falls, Idaho, assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 28, 1971, Ser. No. 110,760

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 R **8 Claims**

Uranium-dioxide-coated aluminum particles in a fluidized bed can be converted to particles of substantially pure uranium monocarbide or particles with a composition comprising a mixture of uranium monocarbide and uranium aluminide by fluidizing the bed with a mixture of carbon tetrachloride and chlorine in varying percentages with argon gas for 1 to 2 hours at a temperature of 320° C. and subsequently fluidizing the bed with argon alone for 1 to 2 hours at a temperature of 800° C.

3,715,319

AGENT FOR THE DISPELLING OF FOG AND PROCESS FOR THEIR PREPARATION

Rudolf Kuhne, Frankfurt am Main; Helmut Diery, Kelkheim, Taunus, and Siegbert Rittner, Frankfurt am Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed April 6, 1971, Ser. No. 131,806

Claims priority, application Germany, April 8, 1970, P 20 16 705.9

Int. Cl. B01d *17/00*

U.S. Cl. 252—319 **14 Claims**

Water-soluble condensation products of phenols and formaldehyde or compounds being capable of splitting off formaldehyde are useful as fog-dispelling agents.

3,715,320

REDUCTION OF NITRATE ION CONCENTRATION BY FORMALDEHYDE TREATMENT IN THE RECOVERY OF OXIDATION CATALYST METALS

Samuel B. Jeffries, Bay City, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,726

Int. Cl. C22b *59/00;* **B01j** *11/02*

U.S. Cl. 423—24 **8 Claims**

An aqueous nitric acid solution such as is derived from an adipic acid process and containing catalyst metal ions is reacted with formaldehyde to remove a substantial portion of the nitrate ions present prior to passing the aqueous nitric acid solution through an ion exchange zone wherein the metals are removed.

3,715,321

CHROMIUM OXIDE POLYMERIZATION CATALYST

Bertalan Horvath, Southern London, England, assignor to Phillips Petroleum Company

No Drawing. Filed Apr. 23, 1969, Ser. No. 818,806

Int. Cl. B01j *11/78*

U.S. Cl. 252—441 **5 Claims**

Additives are provided to a chromic oxide catalyst system used for olefin polymerization which affect the course of reaction and/or the nature of the polymer produced, the additives being compounds of the metals of Group II–A and Group III–B of the Periodic Table.

3,715,322

EXHAUST GAS CATALYST

Shigehiko Kobayashi, Tokyo; Kazuhide Miyazaki, Tokyo, and Michiaki Yamamoto, Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed July 28, 1970, Ser. No. 59,012

Claims priority, application Japan, Jan. 10, 1970, 45/3093; May 4, 1970, 45/38109; May 4, 1970, 45/38110; May 4, 1970, 45/38111; May 4, 1970, 45/38112

Int. Cl. B01j *11/40, 11/06*

U.S. Cl. 252—454 **10 Claims**

A catalyst comprising manganese oxides and lead oxides is effective in oxidizing and purifying the exhaust gases containing carbon monoxide and is possessed of combustion facilitating effect, and further, a catalyst comprising said manganese oxides and lead oxides together with an oxide of alkali earth elements, transition elements, rare earth elements or such substance as silicon dioxide, aluminum oxide, or such metals as aluminum, copper and iron is extremely effective in oxidizing and purifying the exhaust gas containing carbon monoxide.

3,715,323

NITRATION OF AROMATIC RING-CONTAINING COMPOSITIONS

James V. Crivello, Mechanicville, N.Y., assignor to General Electric Company

No Drawing. Original application Oct. 23, 1969, Ser. No. 868,917, now Patent No. 3,634,520. Divided and this application Feb. 25, 1971, Ser. No. 119,006

Int. Cl. C08f *7/10, 7/04;* **C08g** *20/38*

U.S. Cl. 260—47 ET **9 Claims**

Certain aromatic organic compositions containing benzenoid-substituted hydrogen are readily nitrated by treatment with a mixture comprising a perfluoro saturated aliphatic acid anhydride of from 4 to 8 carbon atoms and a nitrating agent of either metal nitrates or ammonium nitrate.

3,715,324

NOVEL CLEANING COMPOSITION

Barry T. Hynes, Nicherson Lane, West Chatham, Mass. 02669; and George S. Krall, 24 Fairview St.; and Michael G. Krall, 45 Rockwood Road, both of Hingham, Mass. 02043

No Drawing. Continuation-in-part of abandoned application Ser. No. 779,618, Nov. 27, 1968. This application Oct. 18, 1971, Ser. No. 190,393

Int. Cl. C11d *3/075, 3/36*

U.S. Cl. 252—529 8 Claims

A novel cleaning composition useful for removing grease and/or carbon from stoves, grilles, cooking utensils and the like. The composition comprises an aqueous or substantially aqueous mixture of sodium hydroxide, a dimethyl polysiloxane, tetrasodium pyrophosphate, a polyethylene oxide mono and/or dihydrogen phosphate ester, a nonyl phenol polyethylene glycol ether and triethanol amine.

3,715,325

INSOLUBLE POLYMERIC DIAZONIUM SALT CHROMOGEN

Gianni Linoli, Lecco, and Enzo Sergio Mannucci, Siena, Italy, assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Continuation-in-part of applications Ser. No. 559,754, June 23, 1966, and Ser. No. 774,490, Nov. 8, 1968. This application Oct. 2, 1970, Ser. No. 77,742

Int. Cl. C08f *27/08*

U.S. Cl. 260—2.2 R 7 Claims

A novel insoluble polymeric diazonium salt chromogen consisting of a diazotized aromatic polyamine bound by an amide linkage to a cation exchange resin can be prepared by reacting a cation exchange resin containing carboxylic acid groups or salts of such carboxylic acid groups with a halogenating agent to convert some of the resin carboxylic acid groups or salts of such acid groups to acyl halide groups, reacting the resulting acyl halide groups with an aromatic polyamine to form a resin containing amide linkages and free aromatic amino groups, and then diazotizing the free aromatic amino groups. The resulting insoluble chromogen can be used to detect coupling compounds by forming colored reaction products with such coupling compounds. This chromogen can also be used to defect enzyme activity wherein the enzyme catalyzes a reaction with a suitable substrate to release a coupling compound which will form a colored reaction product with the insoluble chromogen.

3,715,326

USING MONOISOCYANATES TO PREPARE MICROPOROUS POLYURETHANES

Harro Traubel, Leverkusen, and Harald Oertel, Odenthal-Globrusch, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 696,096, Jan. 8, 1968, abandoned. This application Dec. 4, 1970, Ser. No. 95,345

Claims priority, application Germany, Jan. 10, 1967, P 16 94 127.8

Int. Cl. C08g *22/44, 22/20*

U.S. Cl. 260—2.5 AY 5 Claims

Microporous foils and films are prepared from solutions of a polyurethane or polyurethane urea polymer in a strong polar solvent, the polymer having film forming properties and a molecular weight of at least 10,000 by mixing with the solution from 2 to 200 percent by weight based on the weight of the polymer of (1) and alkyl isocyanate or (2) a polar aliphatic compound having a melting point greater than 35° C. and at least one alkyl or alkylene substituent containing two to 24 carbon atoms, the aliphatic compound being a carboxylic acid amide, a urethane, a urea or a semicarbazide, shaping the solvent solution into a foil or film, removing the solvent and drying the film or foil at a temperature below the softening point of the polyurethane or polyurethane urea polymer.

3,715,327

WATER RESISTANT AND WATER REPELLENT PAINT COMPOSITIONS CONTAINING A LATEX OF A VINYL ESTER POLYMER

Leo Feit, 49 Daventry Court, Johannesburg, Republic of South Africa

Filed May 20, 1971, Ser. No. 145,523

Int. Cl. C09d *3/74*

U.S. Cl. 260—17 R 1 Claim

A water resisting and water repelling paint comprising an aqueous emulsion containing a synthetic latex of a vinyl ester homopolymer or copolymer and as an additive thereto, a product resulting from the thermal interaction of:

a. 0.5 to 15 parts by weight of ethyl cellulose,
b. 0.5 to 20 parts by weight of fatty acid containing 10 to 24 carbon atoms, for example, stearine,
c. 0.25 to 15 parts by weight of mono-, di- or trialkylamine or alkanolamine, for example, triethanolamine, or morpholine,
d. 0.5 to 150 parts by weight of an oil selected from the group of a drying and semi-drying vegetable oil, and mixtures, thereof,
e. 0.5 to 50 parts by weight of a compound selected from the group of phthalic acid ester, benzoic acid ester, phosphoric acid ester, chlorinated diphenyl, substituted diphenyl and mixtures thereof, and/or
f. 0.5 to 50 parts by weight of a compound selected from the group of epoxidized triglyceride ester, epoxidized aliphatic alcohol ester of unsaturated fatty acids having a molecular weight of 300 to 5,000 and mixtures thereof,
g. 0.5 to 50 parts by weight of a compound selected from the group of calcium stearate, magnesium stearate, aluminum stearate and mixtures thereof, and/or
h. 0.5 to 50 parts by weight of mineral oil, specific gravity of 0.85 to 0.95 and boiling point of 185° to 285° C.

3,715,328

COBALT II HALIDE HYDRAZINE COMPLEXES

Christian H. Stapfer, Newton, Pa., and Richard W. D'Andrea, New Hope, both of Pa., assignors to Carlisle Chemical Works, Inc., Reading, Ohio

Division of Ser. No. 26,161, April 6, 1970, Pat. No. 3,689,616. This application Sept. 16, 1971, Ser. No. 181,213

Int. Cl. C08f *21/04*; C08g *17/16*; C09d *3/68*

U.S. Cl. 260—22 CA 24 Claims

Cobalt (II) halide trihydrazinates of the formula

$$[Co(II)(R—NH—NH_2)_3]X_2$$

are prepared as well as Cobalt (II) halide tris(hydrazine hydrochloride) complexes of the formula

$$[Co(II)(N_2H_4 \cdot HX)_3]X_2$$

where R is H, alkyl, aryl, haloaryl and X is halogen. The compounds are useful as driers for alkyd resins and to accelerate the oxidative polymerization of olefinic polymer systems, particularly unsaturated polyesters, in conjunction with organic peroxides and as promoters for ketone aldol condensation. Known Co II complexes of the formula $[Co(II)(R—NH—NH_2)_3]X_2$ also have these same uses.

3,715,329

HEAT VULCANIZABLE POLYSILOXANE COMPOSITIONS CONTAINING ASBESTOS

Frank J. Glaister, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed April 15, 1971, Ser. No. 134,438

Int. Cl. C08g *51/10, 51/02*

U.S. Cl. 260—37 SB 9 Claims

A heat vulcanizable silicone rubber composition comprising 5 to 94.47 percent by weight of an organopolysiloxane

polymer, 5 to 75 percent by weight of an asbestos filter, and 0.25 to 10 percent by weight of an acrylic ester. The composition also includes a silica filler, a peroxide curing catalyst and a process aid. The preferred acrylic ester are methyl acrylate and trimethylolpropanethimethacrylate.

3,715,330

SELF-THERMOSET UNSATURATED POLYESTERS AND METHOD FOR PREPARATION THEREOF

Sumitaka Nogami, Saitama; Shizuko Saito, and Tooru Okada, both of Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1971, Ser. No. 141,943
Claims priority, application Japan, May 20, 1970, 45/42366
Int. Cl. C08f *11/02*
U.S. Cl. 260—40 R 40 Claims

A stable self-thermoset unsaturated polyester resin having at least one terminal norbornene radical, is provided. The resin is characterized by excellent mechanical properties, making it useful as a component of coating compositions and fiber reinforced polyesters.

3,715,331

MONOMER SOLUBLE X-RAY OPAQUE METHACRYLATE PARTICLES

Eugene J. Molnar, La Grange, Ill., assignor to Coe Laboratories

No Drawing. Filed May 1, 1970, Ser. No. 33,863
Int. Cl. C08f *45/04*; A61k *5/02*
U.S. Cl. 260—41 B 3 Claims

Fine granular methacrylate particles in bead form have aliphatic halides distributed through the beads to provide an X-ray opaque material. The beads are prepared by dissolving the aliphatic halide in a liquid alkyl ester methacrylate and conducting a suspension polymerization of the monomer. Such X-ray opaque beads are surface tinted with colored heavy metal compounds to provide desired colors and to improve radiopacity. These polymers are advantageously soluble in liquid methyl metacrylate monomer so that articles may be molded therefrom.

3,715,332

RUBBER STOCK COMPOSITION FOR BONDING TO TEXTILE REINFORCEMENT CONTAINING A PHENOL-FORMALDEHYDE PRECURSOR WHEREIN THE FORMALDEHYDE PRECURSOR CONSISTS OF A LINEAR POLYOXYMETHYLENE

Helmut Junkermann, Frankfurt, and Erhard Klotzer, Hanau, both of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Oct. 30, 1970, Ser. No. 85,773
Int. Cl. C08d *9/10*, *13/16*
U.S. Cl. 260—41.5 R 16 Claims

A vulcanizable rubber stock composition adapted for firm bonding to a textile reinforcement during vulcanization comprises a natural or synthetic rubber compound, a filler, a phenol or amine and a formaldehyde precursor suited to form a resin with the phenol or amine during vulcanization and consisting of a linear polyoxymethylene of the formula

$$HO \cdot (CH_2O)_n \cdot H$$

wherein *n* indicates the average degree of condensation (chain length of the formaldehyde units) and is between 100 and 1,000.

The linear polyoxymethylenes are formed by subjecting paraformaldehyde of an average chain length in excess of 30 and up to 100 or, if below 30, a mixture of formaldehyde with a finely ground solid acid to tempering at an elevated temperature.

3,715,333

POLYVINYLCHLORIDE STABILIZATION WITH MIXTURES OF TIN SALTS

William A. Larkin, Morristown, N.J., assignor to M & T Chemicals Inc., New York, N.Y.

Filed Nov. 13, 1969, Ser. No. 876,599
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 R 6 Claims

This invention relates to stabilizing compositions; to the process for preparing a novel halogen-containing polymer; and to polymers stabilized against the deteriorative effect of heat which comprises a vinyl chloride or vinylidene chloride homopolymer or copolymer and a stabilizing amount of: as a first stabilizer an organotin halide exhibiting the formula $RSnX_3$ wherein R is a hydrocarbon and X is halogen and as a second stabilizer a sulfur-containing organotin compound exhibiting two direct carbon to tin bonds and two direct sulfur to tin bonds.

3,715,334

PLATINUM-VINYLSILOXANES

Bruce D. Karstedt, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 834,580, March 19, 1969, abandoned, which is a division of Ser. No. 152,476, Aug. 14, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 598,148, Dec. 1, 1966, abandoned, and Ser. No. 598,216, Dec. 1, 1966, abandoned. This application Nov. 27, 1970, Ser. No. 93,435
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 UA 7 Claims

Hydrosilation catalysts are provided in the form of platinum-vinylsiloxanes which are substantially free of chemically combined halogen. The platinum-vinylsiloxanes can be made by effecting removal of chemically combined halogen from a platinum halide-vinylsiloxane reaction product. The platinum-vinylsiloxanes can be employed as hydrosilation catalysts to make curable organopolysiloxane compositions.

3,715,335

LINEAR POLYESTER BACKBONE QUATERNARY AMMONIUM POLYELECTROLYTES

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 23,029, Mar. 26, 1970. This application Mar. 4, 1971, Ser. No. 121,184
Int. Cl. C08g *17/14*
U.S. Cl. 260—75 N 4 Claims

Cationic polyelectrolytes having a linear polyester backbone with attached side chains containing quaternary ammonium epoxide groups and optional hydroxyl or primary amine groups.

3,715,336

COPOLYMERS OF VINYL AMINE AND VINYL ALCOHOL AS FLOCCULANTS

Robert M. Nowak; James T. K. Woo, and Dietrich H. Heinert, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 7, 1971, Ser. No. 104,814
Int. Cl. C08g *22/04*
U.S. Cl. 260—77.5 BB 6 Claims

Vinyl amine/vinyl alcohol copolymers prepared by hydrolysis of vinyl carbamate/vinyl acetate copolymers serve as effective flocculants in the clarification of aqueous suspensions of finely divided inorganic solids.

3,715,337

PREPARATION OF POLY(ISOCYANURATE-URETHANES) USING TRITHIOCARBONATES AS CATALYSTS

Michael George Allen, Hudson, Wis., and George Van Dyke Tiers, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 1, 1971, Ser. No. 148,938
Int. Cl. C08g *22/40*; C07c *154/00*
U.S. Cl. 260—77.5 NC 9 Claims

Polyisocyanates are trimerized, polymerized, or reacted with polyols in the presence of a trithiocarbonate salt catalyst, such as sodium ethyltrithiocarbonate, to produce polyisocyanurates, or poly(isocyanurate-urethanes).

3,715,338

SEALING COMPOSITIONS FROM POLYKETIMINES ON POLYENAMINES

Hans-Georg Schmelzer, New Martinsville, W. Va.; Hermann Gruber, Leverkusen, Germany; Eberthart Degener, Leverkusen, Germany, and Kuno Wagner, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesselschaft, Leverkusen, Germany

Continuation of Ser. No. 772,816, Nov. 1, 1968, abandoned. This application July 9, 1971, Ser. No. 161,352
Claims priority, application Germany, Nov. 4, 1967, P 17 19 121.8
Int. Cl. C08g *22/32*
U.S. Cl. 260—77.5 AM 7 Claims

A sealing composition, capable of hardening in the presence of water, is comprised of a polycondensation or polymerization product having a molecular weight of from about 500 to about 10,000 and at least two carbamic acid aryl ester groups and a polyfunctional ketimine or enamine.

3,715,339

CHELATION POLYMER FROM NITRILO COMPOUND AND ETHYLENEIMINE COMPOUND

Norman B. Rainer, Richmond, Va., assignor to Seekay Chemical Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 721,585, April 16, 1968, Pat. No. 3,580,891. This application Dec. 9, 1970, Ser. No. 96,671
Int. Cl. C08g *20/06*
U.S. Cl. 260—78 A 8 Claims

A water-insoluble polymer is produced by reacting, under amide-forming conditions, a nitrilo compound selected from the group consisting of nitrilotriacetic acid, salts of nitrilotriacetic acid, and lower alkyl esters and amides of nitrilotriacetic acid, with a water soluble ethylene imine compound comprised of at least 80 percent by weight of recurring units of the formula $-NHCH_2CH_2-$. The water-insoluble polymer has the ability to absorb polyvalent metal ions from dilute aqueous solutions.

3,715,340

PROCESS FOR PREPARING POLYAMIDES

Arnold B. Finestone, Woodcliff Lake, N.J., and Willard M. Sims, Leominster, Mass., assignors to Foster Grant Co. Inc., Leominster, Mass.

No Drawing. Continuation-in-part of application Ser. No. 878,212, Nov. 19, 1969. This application Aug. 19, 1971, Ser. No. 173,328
Int. Cl. C08g *20/18*
U.S. Cl. 260—78 L 11 Claims

A method of preventing the formation of gel in polyamides prepared from aminocarboxylic acids or lactams comprising adding to the corresponding monomer prior to its polymerization about 0.025 to 0.5 mole, per 100 moles of monomer, of an alkyl ammonium aromatic acid salt or an alkylene bis ammonium aromatic acid salt.

3,715,341

MODIFICATION OF CARBOXYL GROUP CONTAINING POLYMER WITH AZIRIDINYL SUBSTITUTED UNSATURATED LONG CHAIN ACYCLIC HYDROCARBONS

Heinz Uelzmann, Cuyahoga Falls, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 683,137, Nov. 15, 1967, Pat. No. 3,573,278. This application Jan. 19, 1971, Ser. No. 107,697
Int. Cl. C08f *27/08*, *27/00*; C08d *5/02*
U.S. Cl. 260—78.4 D 5 Claims

Unsaturated, long chain, acyclic hydrocarbons having one or two aziridinyl substituents are prepared by reaction of an alkylenimino and a long chain alkatriene in the presence of an alkali metal or equivalent catalyst. The resulting aziridinyl products, e.g., the ethylenimine adduct of allocimene, contain at least three reactive groups, i.e., a combination of two aziridinyl groups and one olefinic unsaturation or one aziridinyl group and two olefinic unsaturations.

3,715,342

RADIATION-CONVERTIBLE NORBORNENE POLYMERS

Henry Octave Colomb, Jr., and David John Trecker, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 804,279, March 4, 1969, Pat. No. 3,554,886, which is a continuation-in-part of Ser. No. 697,635, Jan. 15, 1968, abandoned. This application Sept. 15, 1970, Ser. No. 72,543
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.81 1 Claim

Polymers containing a norbornenyl group are readily cross-linked by irradiation to produce insoluble products. The cross-linked products are useful as coatings on wood, metal, etc., as self-supporting films, wire insulation, for the treatment of fabrics to render them more durable and crease resistant, as well as in the many known areas in which synthetic polymers are employed such as the production of molded and extruded shaped articles.

3,715,343

POLYMERS OF VINYL AMINIMIDES

Robert C. Slagel, Pittsburgh, Pa., and Billy M. Culbertson, Burnsville, Minn., assignors to Ashland Oil, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 24,948, March 20, 1980, Pat. No. 3,664,990, which is a division of Ser. No. 636,273, May 5, 1967, Pat. No. 3,527,802. This application Aug. 11, 1971, Ser. No. 170,989
Int. Cl. C08f *3/84*, *15/02*
U.S. Cl. 260—88.1 PN 7 Claims

Linear addition of polymers having pendant quaternized aminimide groups are provided by homo- or copolymerizing a quaternary derivative of a N,N-disubstituted acid hydrazide wherein the acyl moiety is acrylyl, methacrylyl, or crotonyl. The quaternized aminimide groups of such polymers are neutralized and then converted to isocyanate groups. Polyurethane and polyurea cross-links can be prepared from the resultant polyisocyanates having utility in molding, surface coating, adhesive and the like applications.

3,715,344

REGULAR LINEAR HEAD-TO-TAIL POLYMERIZATES OF CERTAIN UNSATURATED HYDROCARBONS AND FILAMENTS COMPRISING SAID POLYMERIZATES

Giulio Natta, Piero Pino, and Giorgio Mazzanti, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed June 8, 1955, Ser. No. 514,099
Claims priority, application Italy, June 8, 1954, 24,227/54; July 27, 1954, 25,109/54
Int. Cl. C08f *3/10*
U.S. Cl. 260—93.7 4 Claims

1. Normally solid polypropylene, consisting essentially of recurring propylene units, having a substantial crystalline polypropylene content.

3,715,345

GLUCAGON SEPARATION PROCESS

Milton R. Smith, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 3, 1970, Ser. No. 60,617
Int. Cl. C07c *103/52*; C07g *7/00*
U.S. Cl. 260—112.5 3 Claims

Glucagon is separated from insulin by using a sulfonated macroreticular styrene-divinylbenzene copolymer resin.

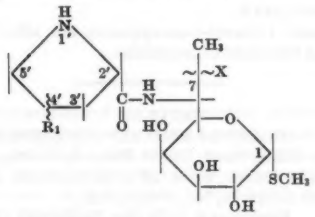
3,715,346

PROCESS FOR THE PREPARATION OF LINCOMYCIN COMPOUNDS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

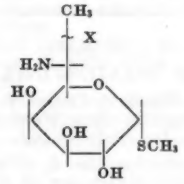
Continuation-in-part of Ser. No. 796,558, Feb. 4, 1969, Pat. No. 3,634,043. This application Nov. 18, 1970, Ser. No. 90,846
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 R 6 Claims

A simplified process for obtaining active lincomycin compounds of the formula



I

wherein R_1 is an alkyl of four to seven carbon atoms, inclusive, and wherein X is selected from the group consisting of 7(R)-hydroxy and 7(S)-chloro, consists of two steps: (1) condensing a 1-carbobenzoxy-4-alkylproline (all four isomers) wherein the alkyl group has four to seven carbon atoms, inclusive, and a methyl thiolincosaminide (III) of the formula:



III

wherein X is defined as herein described above, in water or acetone-water solution; separating the soluble from the insoluble fraction; and (2) removing the protective carbobenzoxy group by hydrogenolysis, separately from each fraction; to obtain an active trans-L and cis-L-lincomycin compound of the formula I above, and separately an analogous trans-D and cis-D-lincomycin product.

3,715,347

PROCESS FOR ACETYLATION

Douglas O. Spry, Indianapolis, and Ian G. Wright, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 6, 1970, Ser. No. 87,634
Int. Cl. C07d *99/16*, *99/24*
U.S. Cl. 260—239.1 4 Claims

6-Aminopenicillanic acid, 3-acetoxymethyl-7-amino-Δ^3-cephem-4-carboxylic acid and 3-methyl-7-amino-Δ^3-cephem-4-car-boxylic acid and esters thereof are reacted with ketene in an aqueous or inert non-aqueous solvent at a temperature between about 5° and about 35° C. to provide the corresponding acetamido derivatives in superior yields. 6-Acetamidopenicillanic acid, 3-acetoxymethyl-7-acetamido-Δ^3-cephem-4-carboxylic acid, 3-methyl-7-acetamido-Δ^3-cephem-4-carboxylic acid and the esters thereof are useful intermediates for the preparation of cephalosporin antibiotics.

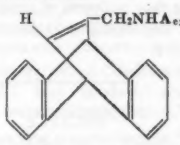
3,715,348

SPIRO AZIRIDINE-ETHENOANTHRACENE COMPOUNDS

Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 19, 1970, Ser. No. 47,906
Int. Cl. C07c *87/28*, *103/34*; C07d *23/02*
U.S. Cl. 260—239 E 4 Claims

Process for the preparation of 11-N-acylaminomethyl-9,10-ethenoanthracenes of the formula



which are antidepressants, by pyrolytic isomerization of the corresponding 11-spiro-attached N-acylaziridines.

3,715,349

17-HYDROXY-7α-MERCAPTO-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONE

Paul B. Sollman, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,366
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.57 1 Claim

Preparation and the diuretic utility of the captioned compound are disclosed.

3,715,350

NOVEL METHOD FOR THE PREPARATION OF 2α,3α-EPITHIO-α-STEROIDS

Yoshio Hamashima, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Filed Apr. 9, 1971, Ser. No. 130,856
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.5 28 Claims

Hormonal 2α,3α-epithio-5α-steroids are prepared by a novel method comprising (i) a new process which consists of treating a 3-halo- or acyloxy-5α-steroid with a basic acid-eliminating reagent to give a corresponding Δ^2-5α-steroid; (ii) another new process consisting of a first step in which a Δ^2-5α-steroid is treated with a sulfur halide compound to give a 3β- or 2β-halo-5α-steroid-2α- or 3α-polysulfide, and a second step in which the product of the first step is treated with reducing and dehalogenating reagents to obtain the objective 2α,3α-epithio-5α-steroids.

3,715,351

CYANINE DYES CONTAINING A CYCLOPENTANONE NUCLEUS

Leslie G. S. Brooker, and Arthur Fumia, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 656,647, July 28, 1967, abandoned. This application Feb. 24, 1970, Ser. No. 17,003
Int. Cl. C09b *23/02*
U.S. Cl. 260—240.4 8 Claims

Novel cyanine dyes containing a cyclopentanone nucleus in the methine chain are prepared by the acid hydrolysis of cyanine enamine derivatives. These cyanine dyes are spectral

sensitizers for photographic silver halide emulsions. A number of the new dyes extend the sensitivity of photographic silver halide emulsions into the red and near infra-red regions of the spectrum.

3,715,352

2-BENZYL-1,4-DIMETHYL-5-HYDROXYMETHYL-2,5-EPIDITHIAPIPERAZINE-3,6-DIONE AND 2-BENZYL-1,4-DIMETHYL-5-HYDROXYMETHYL-2,5-EPITRITHIAPIPERAZINE-3,6-DIONE USEFUL AS ANTI-FUNGAL AGENTS

Robert Larry De Vault, Libertyville, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Filed Dec. 21, 1970, Ser. No. 100,438

Int. Cl. C07d *93/06, 93/36*

U.S. Cl. 260—243 R **3 Claims**

2-Benzyl-1,4-dimethyl-5-hydroxymethyl-2,5-epidithiapiperazine-3,6-dione and 2-benzyl-1,4-dimethyl-5-hydroxymethyl-2,5-epitrithiapiperazine-3,6-dione useful as antifungal agents.

3,715,353

(AMINOALKOXY-BENZYLIDENE)-2H-BENZOTHIAZINE-3(4H)-ONES AND RELATED COMPOUNDS

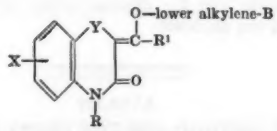
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 80,196

Int. Cl. C07d *93/12*

U.S. Cl. 260—243 R **11 Claims**

Compounds of the following formula and their salts are antidepressants:



R is lower alkyl, cycloalkyl-lower alkyl or aralkyl; R^1 is a mono- or bicyclic radical selected from the group consisting of X^1-phenyl, lower alkylenedioxyphenyl, pyridyl, furyl, naphthyl or thienyl; X is hydrogen, halogen, lower alkyl, trifluoromethyl, lower alkoxy, hydroxy, lower alkylthio, nitro, amino or lower alkanoylamino; X^1 is hydrogen, halogen, trifluoromethyl, lower alkyl, lower alkoxy, hydroxy, lower alkylthio, amino, lower alkanoylamino or mono- or di-lower alkylamino; Y is —O—, —S—, —SO— or —SO_2—; and B is a basic nitrogen containing radical.

3,715,354

OXOISOINDOLES

Karl Schoen, Kew Gardens, and Irwin J. Pachter, Woodbury, N.Y., assignors to Endo Laboratories Inc., Garden City, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 664,942, Sept. 1, 1967. This application Oct. 4, 1968, Ser. No. 765,010

Int. Cl. C07d *87/38*

U.S. Cl. 260—247.5 B **8 Claims**

5-aminomethyl- and 5-(substituted-amino)methyl-4,5,6,7-tetrahydrooxoisoindoles and the acid addition salts thereof are prepared by quaternizing 5-(dimethylamino)methyl- or 5-piperidinomethyl-4,5,6,7-tetrahydrooxoisoindoles, and reacting the quaternary salts either with a base and an amine, or alternatively, with an amine only. Compounds of the indicated types are useful as tranquilizers, antidepressants and analgetics.

3,715,355

N-(MORPHOLINO CARBONYL) 1-LOWER ALKYL-5-NITRO-IMIDAZOLE-2-CARBOXAMIDES

David W. Henry, Menlo Park, Calif.; Dale R. Hoff, and Arthur A. Patchett, Cranford, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 800,405, Feb. 19, 1969, Pat. No. 3,632,817. This application Feb. 12, 1971, Ser. No. 115,130

Int. Cl. C07d *87/42*

U.S. Cl. 260—247.2 A **3 Claims**

Nitroimidazolyl ureas and carbamates having antiprotozoal activity prepared by reaction of 1-loweralkyl-5-nitroimidazole-2-carboxamide with oxalyl halide and then with an appropriate alcohol or amine. The product compounds are useful as parasiticides.

3,715,356

1-PHENYL-6-AZACYTOSINES AS COCCIDIOSTATS

Max W. Miller, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 117,055

Int. Cl. C07d *55/10*

U.S. Cl. 260—249.5 **4 Claims**

Substituted 1-phenyl-6-azacytosines are effective in the control and treatment of coccidiosis.

3,715,357

N-OXIDES OF BENZYLPYRIMIDINES

Gerald Rey-Bellet, Basel; Daniel Ernest Schwartz, Pfeffingen, and Roland Reiner, Basel, all of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed June 4, 1970, Ser. No. 43,607

Claims priority, application Switzerland, June 12, 1969, 8970/69

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 N **11 Claims**

Antibacterially active N-oxides of 2,4-diamino-benzylpyrimidines are described.

3,715,358

METHOD OF TREATING INFLAMMATION

Bruce E. Witzel, Westfield, Conrad P. Dorn, Jr., Plainfield, and Tsung-Ying Shen, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Application Mar. 5, 1970, Ser. No. 16,954, which is a continuation-in-part of abandoned application Ser. No. 687,101, Dec. 1, 1967. Divided and this application May 13, 1971, Ser. No. 143,173

Int. Cl. A61u *27/00*

U.S. Cl. 260—263 **4 Claims**

Inflammation in patients can be advantageously treated by administration of 3- or 4-phenylpyridones with or without substituents on the various rings, or alternatively using 3- or 4-phenyl-2-alkoxy.

3,715,359

HYDROXYLATED ACRONYCINE

Hugh R. Sullivan, Indianapolis, Ind., and Ruth E. Billings, Minneapolis, Minn., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 841,155, July 11, 1969. This application July 2, 1971, Ser. No. 159,563

Int. Cl. C07d *37/16*

U.S. Cl. 260—279 R **7 Claims**

Hydroxylated derivatives of acronycine, useful as antimicrobial agents.

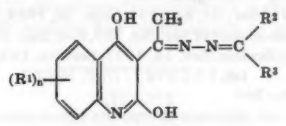
3,715,360

DYES OF THE 2,4-DIHYDROXYQUINOLINE SERIES

Manfred Gaeng, Bobenheim-Roxheim, and Peter Dimroth, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Feb. 19, 1971, Ser. No. 117,086
Int. Cl. C07d 33/50
U.S. Cl. 260—288 R 7 Claims

New dyes having the formula:



(I)

in which R^1 denotes a hydrogen atom, a halogen atom or a nitro group, n denotes the integer 1 or 2, R^2 denotes a hydrogen atom, an unsubstituted or substituted alkyl group having one to three carbon atoms, an aromatic radical or, together with

denotes a five-membered or six-membered carbocyclic or heterocyclic ring which may contain substituents and condensed rings, and R^3 may also denote an unsubstituted or substituted alkyl group having one to three carbon atoms or an aliphatic, aromatic or heterocyclic radical which may be attached by way of —CO—.

The dyes are pigment dyes.

3,715,361

ACYL DERIVATIVES OF 10-METHOXYIBOGAMINE

Joseph William Epstein, Monroe, and Leon Goldman, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 8, 1971, Ser. No. 187,895
Int. Cl. C07d 43/38
U.S. Cl. 260—293.53 4 Claims

This disclosure describes compounds of the class of acyl derivatives of 10-methoxyibogamine useful as analgetic and anti-inflammatory agents.

3,715,362

TETRACYCLIC AZIRIDINE AND METHOD FOR ITS PREPARATION

Samuel J. Dominianni, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 17, 1970, Ser. No. 64,569
Int. Cl. C07d 39/00
U.S. Cl. 260—293.54 2 Claims

A novel tetracyclic aziridine and a method for its preparation are provided.

3,715,363

CERTAIN 2-ALIPHATIC-THIOBENZOTHIAZOLES

John D. Diekman, Menlo Park, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed July 20, 1971, Ser. No. 164,438
Int. Cl. C07d 91/48
U.S. Cl. 260—306 12 Claims

Novel 2-aliphatic-thiobenzothiazoles prepared by the alkylation of 2-mercaptobenzothiazole which are useful for the control of insects.

3,715,364

NITROIMIDAZOLE CARBOXAMIDES

Dale R. Hoff, Basking Ridge, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 567,365, July 25, 1966, abandoned, which is a continuation-in-part of Ser. No. 300,629, Aug. 7, 1963, abandoned. This application Dec. 28, 1970, Ser. No. 102,193
Int. Cl. C07d 49/36
U.S. Cl. 260—309 7 Claims

1-Substituted-5-nitroimidazole-2-carboxamides are prepared from a 1-substituted-5-nitroimidazole-2-carboxylic acid or acid chloride or from a 1-substituted-5-nitroimidazole-2-carboxylic acid γ-lactone by reaction with an amine. The 1-substituted-5-nitroimidazole-2-carboxamides are useful in the treatment of histomoniasis and trichomoniasis.

3,715,365

IMIDAZOLE SYNTHESIS

Heinz Schulze, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Feb. 8, 1971, Ser. No. 113,684
Int. Cl. C07d 49/36
U.S. Cl. 260—309 6 Claims

An improved process for preparing imidazoles by contacting glyoxal or methyl substituted derivatives thereof, formaldehyde, and an ammonium salt of an acid having an ionization constant greater than 1×10^{-3}.

3,715,366

DIARYLIMIDAZO [2,1-A]ISOINDOLES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sander-Wander, Inc., Hanover, N.J.

Filed March 17, 1971, Ser. No. 125,336
Int. Cl. C07d 49/36
U.S. Cl. 260—309 2 Claims

Diarylimidazo 2,1-a isoindoles, e.g., 5-(p-chlorophenyl)-5-phenyl-5H-imidazo 2,1-a isoindoles, are prepared by acid rearrangement of 2-(2'-imidazolyl)-α,α-diaryl substituted benzyl alcohols and are useful as anti-microbials.

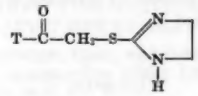
3,715,367

SUBSTITUTED 2-(2-IMIDAZOLIN-2-YLTHIO)ACETOPHENONES

Halbert C. White, Indianapolis, Ind.; Stanley J. Strycker, and Don V. Wysong, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed March 1, 1971, Ser. No. 119,824
Int. Cl. C07d 49/34
U.S. Cl. 260—309.6 6 Claims

This invention provides substituted compounds corresponding to the formula:



wherein

T represents 2-hydroxy-5-methylphenyl, 4-acetamidophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 3,4-difluorophenyl or 3-trifluoromethylphenyl and their pharmaceutically-acceptable salts, useful as anorectics and as intermediates in the preparation of corresponding bicyclic imidazo-thiazole compounds having antidepressant activity.

3,715,368
SULFONYL SUBSTITUTED TERPOLYMER FUEL DETERGENTS

Enver Mehmedbasich, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 813,389, March 4, 1969, abandoned, which is a division of Ser. No. 603,787, Dec. 22, 1966, Pat. No. 3,405,952. This application Feb. 16, 1970, Ser. No. 11,778

Int. Cl. C07d *27/10*

U.S. Cl. 260—326.5 SM **6 Claims**

Terpolymer compositions of relatively low molecular weight having aliphatic 1-olefins of from about eight to 30 carbon atoms, N-substituted maleimides and olefins having a sulfone interrupted chain. The compositions find use as detergents in fuels.

3,715,369
2(3-PHENYL-3-HYDROXYPROPYL 1-2 AMINO) ETHYL-THIENYL-(3)-KETONE

Klaus Posselt, Westerwaldstrasse 46A, Bergen-Enkheim, Germany, and Kurt Thiele, Beethovenstrasse 6, Frankfurt am Main, Germany

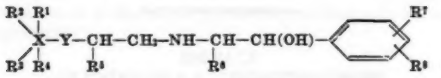
No Drawing. Continuation-in-part of application Ser. No. 693,138, Dec. 26, 1967. This application Mar. 27, 1970, Ser. No. 23,455

Claims priority, application Germany, Dec. 30, 1966, D 51,910, D 51,911

Int. Cl. C07d *63/10*

U.S. Cl. 260—332.3 C **1 Claim**

Compounds of the formula



(I)

their salts and quaternary ammonium compounds, as well as their optically active isomers or diastereomers wherein R^1 to R^4 represent hydrogen, halogen, lower alkyl, aralkyl, phenyl, hydroxyl, lower alkoxy, nitro or lower carboalkoxy, R^5 and R^6 are hydrogen or methyl, R^7 and R^8 are hydrogen, halogen or lower alkoxy, X is a heterocyclic ring system, mono- or condensed bicyclic, with 1–4 hetero atoms, in which the individual rings have 5 to 6 members and can also contain 1 or more carbonyl groups, Y is —CO— or —CH(OH)—. These compounds have pharmacological activity in that they increase the coronary blood flow by simultaneously causing dilation of the coronaries and an increase in contraction strength.

3,715,370
XANTHENYL KETONE CONTAINING ORGANOSILICON MATERIALS

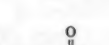
Edward V. Wilkus, Monroe, Conn., and Abe Berger, Schenectady, N.Y., assignors to General Electric Company

Division of Ser. No. 724,300, Feb. 2, 1968, Pat. No. 3,544,595. This application July 20, 1970, Ser. No. 56,632

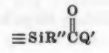
Int. Cl. C07d *5/16, 7/42, 63/12*

U.S. Cl. 260—335 **2 Claims**

One class of organosilicon materials are provided having chemically combined



units, where R'' is a divalent hydrocarbon radical and Q is a radical selected from aryloxyaryl, arylthioaryl, arylsulfonylaryl, and certain heteroaromatic radicals. In addition, organosilicon polymers and copolymers are provided having chemically combined



units, where Q' is a radical selected from Q radicals, monovalent aromatic hydrocarbon radicals and halogenated monovalent aromatic hydrocarbon radicals. The monomers and polymers can be employed as perfume oil bases, in cosmetics and as fluids in the manufacture of elastomers and resins.

3,715,371
ADHESION PROMOTING AGENTS

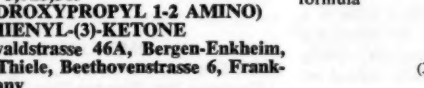
J. Brent Thomson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 862,531, Sept. 30, 1969, which is a continuation-in-part of Ser. No. 789,974, Dec. 31, 1968. This application Nov. 16, 1971, Ser. No. 199,386

Int. Cl. C07d *117/00, 103/02*

U.S. Cl. 260—349 **2 Claims**

Disclosed are nitrogen containing silane compounds of the formula



where R is an organic radical, X is selected from halo, hydroxy, alkoxy, aryloxy, organo oxycarbonyl, azido, amino, and amide radicals; T is selected from alkyl, cycloalkyl, aryl, alkaryl, and aralkyl radicals; *a* is an integer from 1 to 3; *b* is an integer from 0 to 2; *c* is an integer from 1 to 10; *d* is an integer from 1 to 3; and *a+b+d* equals 4; where R' is selected from hydrogen, alkyl, cycloalkyl, aryl and —COOR'' radicals; where R'' is selected from alkyl, cycloalkyl, and aryl radicals.

3,715,372
DERIVATIVES OF ANTIBIOTIC X-537A

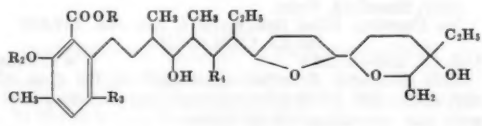
Arthur Stempel, Teaneck, and John Westley, Passaic, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 18, 1969, Ser. No. 851,044

Int. Cl. A23k *1/17;* **A61k** *21/00;* **C07d** *7/100*

U.S. Cl. 260—345.8 **13 Claims**

Compound of the formula



where R_1 is hydrogen, lower alkyl, phenyl, or phenyl substituted by halogen, nitro or lower alkyl; R_2 is hydrogen; lower alkyl; lower alkanoyl; benzoyl; benzoyl substituted by halogen, nitro or lower alkyl; or

R_3 is hydrogen, halogen; nitro, amino, loweralkylamido or lower alkylamino; R_4 is —OH, = O or = NOH which compound is useful as a coccidiostatic agent and as an anti-bacterial agent.

3,715,373
PREPARATION OF 1,4-DIAMINO-2-ALKOXY (PHENOXY)-ANTHRAQUINONES

David Arthur Andrews, Upper Montclair, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

Continuation-in-part of Ser. No. 730,639, May 20, 1968, abandoned. This application Jan. 21, 1970, Ser. No. 4,738

Int. Cl. C09b *1/54*

U.S. Cl. 260—380 **10 Claims**

1,4-diamino-2-alkoxy (or phenoxy) anthraquinones are prepared by heating an acyl-substituted 1,4-diamino-2-haloanthraquinone in the presence of an alkali alkoxide (or phenoxide) in a solvent. The products formed are valuable dyestuffs.

3,715,374

24,25-DIHYDROXYCHOLECALCIFEROL

Hector F. De Luca, Madison, Wis., assignor to the Wisconsin Alumni Research Foundation, Madison, Wis.

No Drawing. Continuation-in-part of application Ser. No. 157,020, June 25, 1971. This application May 5, 1972, Ser. No. 250,661

Int. Cl. C07c *171/10*

U.S. Cl. 260—397.2 1 Claim

24,25-dihydroxycholecalciferol and methods for preparing same. 24,25-dihydroxycholecalciferol is characterized by antirachitic activity and by its ability to induce bone mobilization.

3,715,375

NEW DIPHENYL SULFONES

Tsung-Ying Shen, Westfield; William V. Ruyle, Scotch Plains; Michael W. Fordice, Clark, and Norman P. Jensen, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 17, 1970, Ser. No. 73,247

Int. Cl. C07c *147/06*

U.S. Cl. 260—397.6 1 Claim

New substituted diphenyl sulfones useful in reducing mortality and decreasing lesion incidence of poultry exposed to Marek's disease are disclosed.

3,715,376

NOVEL PROCESS FOR THE PREPARATION OF 17a-HYDROXY-PREGNA-1,4,9(11)-TRIENE-3,20-DIONE

Joseph Elks, London N.W. 11, England, assignor to Glaxo Laboratories, Greenford, England

Filed May 25, 1970, Ser. No. 40,422

Int. Cl. C07c *169/32*

U.S. Cl. 260—397.45 3 Claims

This invention relates to a novel intermediate in the synthesis of steroids having hormonal activity and to processes for its preparation and further conversion.

3,715,377

PREPARATION OF ORGANOSILICONE ESTERS

George R. Siciliano, Ballston Lake, N.Y., assignor to General Electric Company

Filed Dec. 16, 1971, Ser. No. 208,908

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 E 17 Claims

A process for forming an organosilicone ester which comprises reacting a carboxysilicone and an alcohol in the presence of a sorbent-acid catalyst system.

3,715,378

FLUORINATED PEROXY POLYETHER COPOLYMERS AND METHOD FOR PREPARING THEM FROM TETRAFLUOROETHYLENE

Dario Sianesi and Adolfo Pasetti, Milan, and Giorgio Belardinelli, Modena, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,533

Claims priority, application Italy, Feb. 9, 1967, 12,460/67

Int. Cl. C07c *51/58, 59/22*

U.S. Cl. 260—463 7 Claims

Fluorinated linear polyethers of the general formula

$$A—O—(C_2F_4—O—)_P—(CF_2—O—)_Q—(O)_R—B$$

wherein C_2F_4 represents a perfluoroalkylene unit derived from the opening of a double bond of a molecule of tetrafluoroethylene; —(O)— represents an oxygen atom having a random distribution along the polymer chain and linked in the peroxidic form to the different oxyperfluoroalkylene units; A and B may be the same or different and each is a radical selected from the group consisting of CF_3—, —COF, and —CF_2—COF; P and Q are each from 1 to 199, R is from 0 to 199, the sum of $P+Q$ is between 2 and 200, the ratio Q/P is between 0.1 and 10, the ratio R/P is between 0 and 1, and the ratio $R/(P+Q+1)$ is between 0 and 0.8. Also includes derivatives of such polyethers, as by hydrolysis, esterification, salt formation, amidation, dehydration of the amide to a nitrile, and decarboxylation. Method of preparing polyethers by photochemical reaction of molecular oxygen with a solution of perfluoroethylene. These peroxy-polyethers can be used as hydraulic fluids, heat exchange liquids, lubricants and as plasticizers.

3,715,379

PROCESS FOR THE MANUFACTURE OF ORTHOCHLOROBENZALMALONONITRILE

Walter L. Berry, Jr., Yardley, Pa.; Dan P. Nisonger, and Preston S. Craig, both of St. Simons Island, Ga., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Continuation-in-part of Ser. No. 691,192, Dec. 18, 1967, abandoned. This application Feb. 3, 1970, Ser. No. 8,388

Int. Cl. C07c *121/70*

U.S. Cl. 260—465 G 6 Claims

A process for preparing orthochlorobenzalmalononitrile, useful as a chemical riot control agent, directly from the solventless reaction of neat orthochlorobenzaldehyde and malononitrile, in the presence of an organic or inorganic catalyst.

3,715,380

ALKYL-N-ALKYL-CHLOROPHENOXYTHIOACETIMIDATES

Edmund J. Rumanowski, Dover, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 839,078, July 3, 1969, Pat. No. 3,647,413. This application Sept. 23, 1971, Ser. No. 183,247

Int. Cl. C07c *119/20*

U.S. Cl. 260—453 R 3 Claims

Alkyl-N-alkyl-chlorophenoxythioacetimidates are prepared by reacting N-alkyl-di- or trichlorophenoxythioacetamide with alkyl iodide in the presence of sodium alcoholate. The compounds are useful as herbicides.

3,715,381

POLYISOCYANATE COMPOSITIONS STABILIZED AGAINST DISCOLORATION

Richard G. Spaunburgh, Elma, and John B. Hino, Cheektowaga, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed June 11, 1969, Ser. No. 832,420

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 P 7 Claims

Organic polyisocyanate compositions are stabilized against discoloration by having incorporated therein from about 0.0001 to 0.003 percent by weight of 2,6-di-tert-butyl-p-cresol as stabilizer therefor.

3,715,382

N-ACYL-α-HYDRAZINO-β-(PHENYL) PROPIONITRILES

Sandor Karady, Elizabeth; Seemon H. Pines, Murray Hill; Manuel G. Ly, New Brunswick, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 5, 1970, Ser. No. 9,052
Int. Cl. C07c *101/72, 103/28, 121/78*
U.S. Cl. 260—465 D 5 Claims

Diastereomers of N-acyl α-hydrazino-β-(substituted or unsubstituted phenyl) propionitriles which can be separated and hydrolyzed to give compounds useful as decarboxylase inhibitors.

3,715,383

PURIFICATION OF TETRABROMOPHTHALIC ANHYDRIDE

Hans Eberhard Praetzel, Schuberstrasse 3, Bensberg-Frankenforst; Ernst Neukirchen, Vorsterstrasse 75, Cologne-Kalk, and Herbert Jenkner, Deutz-Kalker-Str. 66, Cologne-Deutz all of Germany

Filed Jan. 29, 1970, Ser. No. 6,934
Claims priority, application Germany, Jan. 30, 1969, P 19 04 646.9; Jan. 31, 1969, P 19 04 537.5
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 PR 10 Claims

A process for removing sulfate ions from crude tetrabromophthalic anhydride by dissolving it in an alcohol and then contacting the resultant solution with an anion exchanger.

3,715,384

PESTICIDAL ESTERS OF 2,6-DINITRO-4-ALKYL PHENOLS

Max Pianka, 67 Sandpit Lane, St. Albans, Hertfordshire, and John Duncan Edwards, 60 Reginald Street, Luton, Bedfordshire, both of England

Continuation of Ser. No. 707,880, Feb. 23, 1968, abandoned, which is a continuation of Ser. No. 476,706, Aug. 2, 1965, abandoned. This application Aug. 27, 1970, Ser. No. 67,583
Int. Cl. C07c *69/24, 69/52, 69/78*
U.S. Cl. 260—479 R 13 Claims

Fungicidal compounds useful for the control of plant mildews are 4-alkyl-2,6-dinitrophenyl esters wherein the 4-alkyl group is selected from 1-ethyl-n-hexyl, 1-n-propyl-n-hexyl, 1-n-butyl-n-hexyl, 1-n-pentyl-n-hexyl, 1-ethyl-n-pentyl, 1-n-propyl-n-pentyl, 1-n-butyl-n-pentyl and 1-n-propyl-n-butyl.

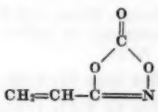
3,715,385

PROCESS FOR THE PREPARATION OF N-VINYL CARBAMIC ACID ESTERS

Larry G. Wolgemuth, Cherry Hill, N.J., and William H. Fritock, Aston, Pa., assignors to Atlantic Richfied Company, New York, N.Y.

Filed Aug. 17, 1970, Ser. No. 64,594
Int. Cl. C07c *125/06*
U.S. Cl. 260—482 C 8 Claims

An improved process for preparing certain N-vinyl carbamic acid esters which comprises condensing at temperatures of about 95 to 150°C., acrylonitrile carbonate of the formula:



with methanol or ethanol to obtain an N-vinyl carbamic acid ester. The condensation-rearrangement reaction is effected in the presence of an inert organic solvent which boils above 100°C. at atmospheric pressure, such as bis[2-(2 methoxyethoxy)ethyl]ethane. The condensation-rearrangement reaction can be carried out in the presence of a soluble, combination metal catalyst such as a sodium alkoxytin catalyst. The reaction can also be carried out in the presence of a free radical inhibitor such as m-dinitrobenzene.

3,715,386

AMINIUM AND DIIMONIUM SALTS USED AS POLYMERIZATION INHIBITORS OF ACRYLATES AND CARBONATES

Allan Ellis Sherr, Warren, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 15, 1970, Ser. No. 37,867
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 8 Claims

A method of inhibiting the polymerization of methacrylate monomers and diallyl diglycol carbonate by the addition thereto of various aminium and diimonium salts and the products produced thereby are disclosed.

3,715,387

FLUOROALKYLENE ALCOHOLS AND ESTERS

Ogden R. Pierce, and Yung Ki Kim, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 874,411, Nov. 5, 1969, Pat. No. 3,681,418. This application Nov. 24, 1971, Ser. No. 202,032
Int. Cl. C07c *33/10, 69/14*
U.S. Cl. 260—488 H 3 Claims

Fluorocompounds of the formula $CH=CH_2(CH_2CH_2)_n R_fCH_2OR$ in which R_f is a perfluoroalkylene radical of no more than 18 carbon atoms and R is a hydrogen atom or acyl radical. These monomers can be polymerized with a free radical catalyst to give

$$-CH_2CH-$$
$$|$$
$$(CH_2CH_2)_nR_fCH_2OR$$

or the compounds can be reacted with ≡SiH to give the corresponding substituted silicon atom.

3,715,388

PROCESS FOR PREPARING GLYCOL ESTERS FROM ETHYLENE AND PROPYLENE

Jon R. Valbert, New York, N.Y., assignor to Halcon International, Inc.

Filed March 1, 1971, Ser. No. 119,969
Int. Cl. C07c *69/16*
U.S. Cl. 260—497 R 13 Claims

Vicinal esters of ethylene glycol and propylene glycol are prepared by continuously reacting ethylene or propylene with molecular oxygen and monobasic carboxylic acids within an oxidation zone containing a liquid phase reaction medium. Selectivity of this liquid phase reaction is improved, without adverse effect upon reaction rate, by maintaining the concentration of the olefin within the liquid phase reaction medium at a level less than about 0.8 wt. percent.

3,715,389

PROCESS FOR PREPARING GLYCOL ESTERS FROM OLEFINICALLY UNSATURATED COMPOUNDS

Robert Hoch, Brooklyn, N.Y., and John Kollar, Wyckoff, N.J., assignors to Halcon International, Inc.

Filed March 1, 1971, Ser. No. 120,018
Int. Cl. C07c *69/16*
U.S. Cl. 260—497 R 20 Claims

Esters of vicinal glycols are prepared by reacting olefinically unsaturated compounds with molecular oxygen and monobasic carboxylic acids in the presence of a liquid phase reaction medium within an oxidation zone. The reaction is

conducted in the presence of a variable valence metal cation and bromine, chlorine, a bromine-containing compound or a chlorine-containing compound. In this process a vapor stream comprising unreacted oxygen and unreacted olefinically unsaturated compound is withdrawn from the oxidation zone and recycled at least in part to the oxidation zone. Rate of formation of the desired glycol esters can be increased by maintaining specified amounts of a third component or mixture of components in the vapor recycled to the reaction system while concurrently maintaining oxygen partial pressure within a specified range.

3,715,390

PROMOTION OF THE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS

Louis J. Croce, Seabrook, Tex., and Bruno J. Barone, Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 755,775, Aug. 28, 1968. This application June 2, 1971, Ser. No. 149,383

Int. Cl. C07c *51/26, 63/02*

U.S. Cl. 260—523 A **5 Claims**

A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,715,391

PROMOTION OF THE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS

Bruno J. Barone, Houston, Tex., and Louis J. Croce, Seabrook, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 755,775, Aug. 28, 1968. This application May 2, 1971, Ser. No. 149,323

Int. Cl. C07c *51/26, 63/02*

U.S. Cl. 260—523 A **5 Claims**

A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,715,392

PRODUCTION OF DINEO-DICARBOXYLIC ACIDS

Bertram Yeomans, Hessle, England, assignor to BP Chemicals Limited, London, England

Filed Jan. 16, 1970, Ser. No. 3,535

Claims priority, application Great Britain, Feb. 20, 1969, 7,056/69

Int. Cl. C07c *51/00*

U.S. Cl. 260—537 R **6 Claims**

Di - neo acids are produced by treating an anhydride of a mono-carboxylic acid, which anhydride contains at least one carbon atom bearing a tertiary hydrogen atom separated from the neo acid group by at least two carbon atoms, with strong acid.

3,715,393

METHOD OF PREPARING SODIUM NITRILOTRIACETATE

Giuseppe Ribaldone, Gallarate, and Salvatore Gafa, Ferrara, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed May 15, 1970, Ser. No. 37,817

Claims priority, application Italy, May 20, 1969, 17018 A/69

Int. Cl. C07c *99/10*

U.S. Cl. 260—534 E **3 Claims**

Preparation of $N(CH_2COONa)_3$ in crystalline form by hydrolyzing $N(CH_2CN)_3$ in the presence of NaOH. Involves suspending $N(CH_2CN)_3$ in recycled mother liquor, adding aqueous NaOH to the suspension, partially hydrolyzing at about 65° to 75°C., further hydrolyzing at about 70° to 90°C. to form $N(CH_2COONa)_3$, separating $N(CH_2COONa)_3$ from the mother liquor, and recycling the mother liquor.

3,715,394

PROCESS FOR THE PREPARATION OF LACTIC ACID

Jacques Boichard, Bernard Pierre Brossard, Michel Louis Marie Joseph Gay, and Raymond Marc Clement Janin, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Nov. 25, 1966, Ser. No. 597,079

Claims priority, application France, Dec. 1, 1965, 40,514

Int. Cl. C07c *59/08*

U.S. Cl. 260—535 R **14 Claims**

Lactic acid is made by oxidizing propylene with nitric acid and/or nitrogen peroxide and hydrolysing the product with water.

3,715,395

SUBSTITUTED THIOBENZANILIDES

Helmut Mrozik, Matawan, and Dale R. Hoff, Basking Ridge, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 656,031, July 26, 1967. This application Sept. 11, 1970, Ser. No. 71,417

Int. Cl. C07c *153/05*

U.S. Cl. 260—551 S **1 Claim**

2-hydroxy thiobenzanilides having an aromatic ring linked to the aniline moiety by oxygen or sulfur are disclosed as are processes for the preparation of novel 2-hydroxy thiobenzanilides from the corresponding salicylanilides. Anthelmintic compositions useful in the treatment of parasitic diseases containing a substituted 2-hydroxy thiobenzanilide as an active ingredient are also disclosed.

3,715,396

N-AMINO-BENZAMIDINES

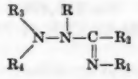
Victor Bandurco, Huntington Station; Bill Elpern, White Plains, and James R. Shroff, Bronx, all of N.Y., assignors to USV Pharmaceutical Corporation

Filed Nov. 4, 1969, Ser. No. 874,083

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **5 Claims**

Compounds of the formula



wherein R is hydrogen, alkyl, acyl, phenyl-lower alkyl, carbamoyl, benzoyl, R_1 is lower alkyl, pyridyl, naphthyl, or cycloalkyl, R_2 is phenyl or substituted phenyl, and R_3 and R_4 are hydrogen, lower alkyl, phenyl or phenyl-lower alkyl, or taken together are alkylene, possess anti-inflammatory activity.

3,715,397

PROCESS FOR PREPARING PARA-AMINOPHENOL

Paul N. Rylander, Newark; Irene M. Karpenko, Irvington, and George R. Pond, Newark, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation

Filed April 16, 1970, Ser. No. 29,054

Int. Cl. C07c *91/44*

U.S. Cl. 260—575 **1 Claim**

In an improved process for preparing aromatic hydroxyamines by the selective hydrogenation of aromatic nitro com-

pounds and rearrangement in the presence of a platinum group metal catalyst and dilute sulfuric acid, the hydrogenation is carried out in the presence of dimethylsulfoxide.

3,715,398

PROCESS FOR RECRYSTALLIZING DIAMINOTRINITROBENZENE

Martin H. Kaufman, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 20, 1960, Ser. No. 63,934
Int. Cl. C07c *85/16*
U.S. Cl. 260—582 **3 Claims**

1. A process for effecting the recrystallization of diaminotrinitrobenzene comprising the steps of dissolving diaminotrinitrobenzene in dimethyl sulfoxide at steam bath temperature, cooling the reaction mixture to about 10° C. until precipitation is almost complete, filtering, washing the precipitate with a solvent selected from the group consisting of ethanol, methanol and acetone to destroy the complex, and drying at room temperature.

3,715,399

2,2,4,4-TETRAKIS(DIFLUOROAMINO)PENTANE PROCESS

Royland D. Shoults, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 12, 1968, Ser. No. 775,999
Int. Cl. C07c *85/04*
U.S. Cl. 260—583 NH **2 Claims**

2,2,4,4-Tetrakis(difluoramino)pentane and a process for its preparation. This novel composition of matter is a high energy compound for sue as a plasticizer and/or oxidizer in propellant compositions. A practical process of synthesis of this compound has been developed. This process involves the interaction of 2,4-pentanedione and difluoroamine in the presence of 30 percent fuming sulfuric acid. This process is applicable to other 1,3-dicarbonyl compounds, monocarbonyl compounds in general, diacetates, acetals and enol phosphates.

3,715,400

SYNTHESIS OF HYDROXYCYCLOPENTEN-1-ONES

Richard Wightman Kierstead, North Caldwell, and Ronald Andrew Lemahieu, Bloomfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 706,657, Feb. 19, 1968, Pat. No. 3,484,489, which is a continuation-in-part of Ser. No. 649,441, June 26, 1967, abandoned. This application May 9, 1969, Ser. No. 823,498
Int. Cl. C07c *49/36*
U.S. Cl. 260—586 R **5 Claims**

This invention relates to a process for the preparation of 2-alkenyl-4-hydroxy-3-methyl-2-cyclopenten-1-ones from a 2-alkenyl or 2-alkynyl-3-methyl-2-cyclopenten-1-one and intermediates therein.

3,715,401

PROCESS FOR PRODUCING 3-HYDROXYALKYL ETHERS

Siegfried H. Schroeter, Schenectady, N.Y., assignor to General Electric Company

Continuation-in-part of Ser. No. 732,852, May 29, 1968, abandoned. This application May 1, 1970, Ser. No. 33,903
Int. Cl. C07c *41/00*
U.S. Cl. 260—611 R **6 Claims**

Alkyl ethers having 3-hydroxy substitution are produced by the reaction of a mixture of 2-hydrocarbonoxyoxetanes and 3-hydrocarbonoxyoxetanes with a Grignard reagent at temperatures below 100°C. The 3-hydroxy substituted alkyl ethers are useful as solvents in lacquers, and for chemical reactions, as plasticizers and as starting materials for the preparation of polyoxyalkylene ethers by base catalyzed addition of propylene oxide and ethylene oxide. The polyoxyalkylene ethers are useful as lubricants, surfactants, etc.

3,715,402

REMOVAL OF CATALYSTS FROM POLYOLS

Joseph F. Louvar, Lincoln Park, and Newlin S. Nichols, Dearborn, Mich., assignors to BASF Wyandotte Corporation, Wayne, Mich.

No Drawing. Filed Aug. 8, 1969, Ser. No. 848,740
Int. Cl. C07c *41/12*
U.S. Cl. 260—613 B **7 Claims**

A method for removing water-soluble impurities from water-insoluble polyethers which comprises providing a mixture of water, polyether, a solvent in which the polyether is soluble, and an acid. The solvent employed is substantially immiscible in water, has a density substantially different from water and is relatively inert with respect to the polyether and water, whereby a polyether-solvent solution is formed which is substantially immiscible in water. The solvent is employed in an amount sufficient to adjust the density differential between the polyether-solvent solution and water to at least about 0.03 gram per milliliter. The amount of the acid is sufficient to adjust the pH of the mixture to a value not greater than about 8.0. The polyether-solvent solution is then separated from the water by a suitable method such as electrostatic coalescence or subjection to centrifugal force. A stream of water containing dissolved therein the water-soluble impurities and a stream of polyether-solvent solution are separately recovered after the separation, followed by separating the solvent from the polyether-solvent solution.

3,715,403

SEPARATION OF ALPHA-NAPHTHOL

Joost Manassen, David Vofsi, and Michael Martan, Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,349
Claims priority, application Israel, Dec. 19, 1967, 29,164
Int. Cl. C07c *37/44*
U.S. Cl. 260—621 A **7 Claims**

A process for the separation and recovery of α-naphthol from mixtures thereof with α-tetralone, which comprises extracting such mixtures with an aqueous ammonia or lower alkylamine first extractant and a low boiling aliphatic hydrocarbon second extractant. The α-naphthol is substantially recovered in the aqueous nitrogen compound extractant-containing phase, and may suitably be separated therefrom by evaporation of the low boiling solvent. The separation may suitably be carried out employing countercurrent extraction techniques.

3,715,404

PROCESS FOR SELECTIVE HYDROGENATION

Herbert Lindlar, Reinach, and Robert Dubuis, Morges, both of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 380,038, July 2, 1964, abandoned. This application Sept. 19, 1968, Ser. No. 760,980
Claims priority, application Switzerland, June 3, 1964, 7260/64
Int. Cl. C07c *33/02, 35/02, 57/02*
U.S. Cl. 260—642 **8 Claims**

A process for selective hydrogenation of unsaturated organic compounds having at least four carbon atoms by carry-

ing out said hydrogenation in a liquid phase in the presence of an organic sulfur compound utilizing a partially deactivated palladium catalyst.

3,715,405

PROCESS FOR SELECTIVE HYDROGENATION OF HIGHLY UNSATURATED COMPOUNDS

Akira Misono, and Ikuei Ogata, both of Tokyo, Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 772,416, Oct. 31, 1968, abandoned. This application Dec. 22, 1970, Ser. No. 100,844
Claims priority, application Japan, Nov. 6, 1967, 42/70924
Int. Cl. C07c *5/14, 5/16*
U.S. Cl. 260—666 A **4 Claims**

A process for the selective hydrogenation of cyclododecatriene to produce cyclododecene in the presence of hydrogen at a temperature from 100° to 300°C using,as a catalyst, a cobalt complex compound having three ligands of carbon monoxide and one ligand of phosphine per one atom of cobalt.

3,715,406

PROCESS FOR PRODUCING SYM-OCTAHYDROANTHRACENE FROM SYM-OCTAHYDROPHENANTHREN

Ronald D. Bushick, Markus Hook, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Continuation of Ser. No. 590,225, Oct. 28, 1966, Pat. No. 3,396,203. This application Aug. 2, 1968, Ser. No. 750,432
Int. Cl. C07c *15/28*
U.S. Cl. 260—668 F **1 Claim**

Sym-octahydroanthracene (s-OHA) is produced from sym-octahydrophenanthrene (s-OHP) by a process comprising contacting s-OHP with a solid phase silica-alumina catalyst for a period of time sufficient to isomerize the s-OHP to s-OHA. The s-OHA can be recovered from the reaction mixture and then be converted to anthracene by catalytic dehydrogenation.

3,715,407

CHLORINATION OF KETONIC ACETYL GROUPS

Howard M. Relles, Saratoga, N.Y., assignor to General Electric Company

Continuation-in-part of Ser. No. 67,211, Aug. 26, 1970, abandoned. This application March 1, 1971, Ser. No. 119,839
Int. Cl. C07c *15/04*
U.S. Cl. 260—668 R **18 Claims**

R_3PCl_2 converts the carbonyl group of ketones to chlorine containing groups which, combined with dehydrochlorination methods, provides a new synthetic route for the production of acetylenic compounds useful for making polymers. The R_3PO produced in the reaction is reconverted to R_3PCl_2 by reaction with phosgene thus providing an economical process for converting ketones to chlorine derivatives and from thence to acetylenic derivatives. Each R is C_{1-20} alkyl, phenyl, lower alkylphenyl, halophenyl, phenoxyphenyl or naphthyl.

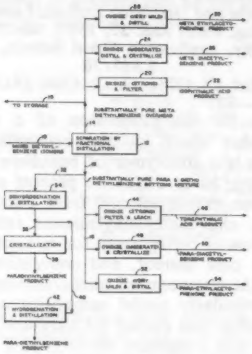
3,715,408

SEPARATION OF DIETHYLBENZENE ISOMERS BY DISTILLATION AND DEHYDROGENATION

Rene Paul Brown; Birt Allison, Jr., both of Big Spring, Tex., and Pierre Marie Joseph Ghislain de Radzitzky D'Ostrowick, Brussels, Belgium, assignors to Cosden Oil & Chemical Company, Big Spring, Tex.

Division of Ser. No. 543,377, April 18, 1966, Pat. No. 3,539,623. This application Jan. 30, 1970, Ser. No. 7,023
Int. Cl. B01d *3/10;* **C07c** *7/04*
U.S. Cl. 260—669 A **13 Claims**

Mixed isomeric diethylbenzenes are separated into pure isomers by first distilling the mixture to separate an overhead concentrate of most of the meta isomer and the mixed para



and ortho bottoms are then dehydrogenated and finally separated into substantially pure ortho and para isomers.

3,715,409

HYDROCARBON SEPARATION

Donald B. Broughton, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 8, 1971, Ser. No. 122,072
Int. Cl. C07c *7/12*
U.S. Cl. 260—674 SA **16 Claims**

An improved process for the separation of hydrocarbons from a feed stock which process comprises the adsorption of a selected feed component followed by the desorption of a selected feed component from a solid adsorbent through the use of a desorbent material. The adsorption is performed in adsorption zone while the desorption is performed in a desorption zone. The adsorption zone and desorption zones are separated by a purification zone in which the adsorbed component of the feed stock is effectively purified and allowed to become more concentrated on the adsorbent as it enters the desorption zone. The improvement of the process comprises the use of a buffer zone which is represented by a quantity of adsorbent material located between an adsorption zone and a desorption zone and which allows raffinate material which normally would be withdrawn from an adsorption zone to be partially diverted and passed into the buffer zone to displace desorbent material in that zone which displaced desorbent material passes into a desorption zone. The improvement allows the prevent of contamination of the extract product by raffinate components and also allows the more efficient use of desorbent by reducing the absolute quantity of desorbent needed for a given separation at given feed rates.

3,715,410

CONVERSION OF CYCLIC OLEFINS TO ACYCLIC POLYENES

Gardner C. Ray and Donald L. Crain, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Continuation of application Ser. No. 529,230, Feb. 23, 1966. This application June 20, 1969, Ser. No. 845,596
Int. Cl. C07c *3/20*
U.S. Cl. 260—680 R **23 Claims**

Cyclic olefins are converted to acyclic polyenes by reaction with acyclic olefins in the presence of an olefin disproportionation catalyst.

3,715,411

PREPARATION OF NITRILE/SILICONE RUBBER

John Day and David Kenneth Thomas, Farnham, England, assignors to Minister of Aviation Supply in Her Britannic Majesty's Government of United Kingdom of Great Britain and Northern Ireland, London, England

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,277
Claims priority, application Great Britain, Feb. 4, 1970, 5,357/70
Int. Cl. C08g 47/10; C08f 29/56
U.S. Cl. 260—827 7 Claims

A process for the production of a nitrile/silicone specialty rubber which includes compounding a nitrile rubber which is a copolymer of butadiene and acrylonitrile containing 20 to 30 moles percent of acrylonitrile with a silicone rubber selected from fluorovinylsilicone, alkylsilicone, and methylvinylsilicone rubbers together with an amount of curing agent for said rubbers sufficient to effect the cure thereof, and conventional fillers and then curing the compounded nitrile/silicone rubber composition. Particularly useful compositions are obtained by compounding and curing 3,3,3-trifluoropropylmethylvinylsilicone with a medium nitrile rubber which is a copolymer of butadiene and acrylonitrile containing 25–30 moles percent of acrylonitrile, or by compounding and curing a nitrile rubber with a methyl vinylsilicone rubber which includes 0.15 to 0.56 mole percent of vinyl groups. Advantageously, the curing agent is an organic peroxide curing agent and a preferred curing agent is 2,5-dimethyl-2,5-ditertiarybutylperoxyhexane.

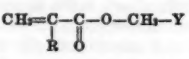
3,715,412

STABILIZED POLYURETHANE ELASTOMER COMPOSITION

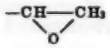
Yasuji Nakahara and Kiyoshi Ichikawa, both of 100 Kawanarijima, and Kunio Kondo, 174 Miyajima, all of Fujishi, Shizuokaken, Japan

No Drawing. Filed Mar. 3, 1971, Ser. No. 128,630
Int. Cl. C08g 45/14
U.S. Cl. 260—835 6 Claims

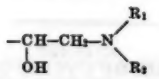
The invention provides a polymeric composition having an intrinsic viscosity of 0.05–1.2, which gives a stabilized polyurethane elastomer composition having an excellent whiteness-retainability by mixing with or coating upon a polyurethane elastomer prepared from a substantially linear polymer having terminal hydroxy groups and a molecular weight of 600 to 5000, an organic diisocyanate and a bifunctional chain extender having active hydrogen atoms, said polymeric composition comprises a vinyl polymer of a monomer of the formula:



wherein R is hydrogen or lower alkyl and Y is a member selected from the group consisting of:



(I)



(II)

wherein R_1 and R_2 are individually alkyl group having 1–20 carbon atoms; substituted alkyl group having 1–20 total carbon atoms wherein substituent may contain O, N or S atom; cycloalkyl having 3–20 carbon atoms; substituted cycloalkyl having 3–20 total carbon atoms wherein substituent may contain O, N or S atom; aromatic group of 1 to 2 rings, having 6–20 total carbon atoms wherein said ring or rings may have 1 to 3 substituents selected from the group consisting of halo, alkyl and hydroxy groups; 5- to 6-membered heterocyclic radical wherein said ring may have substituent selected from the group consisting of halo, phenoxy, alkyl-substituted phenoxy, hydroxy-substituted phenoxy, phenylthio, alkyl-substituted phenylthio, hydroxy-substituted phenylthio, alkoxy and alkylthio or

wherein R_3 and R_4 have the same meaning as R_1 and R_2 but must not be hydrogen, further R_1 and R_2 can collectively form 5- to 6-membered ring wherein said ring may contain S, O or N, alkyl or halogen substituent, and one of R_1 and R_2 can be a hydrogen atom; at least 5% of the Y groups being II.

3,715,413

VINYL CHLORIDE-PROPYLENE COPOLYMER GRAFTED WITH BUTADIENE, α-METHACRYLONITRILE AND OPTIONALLY STYRENE

Joseph K. Hoffman, Glen Gardner, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 102,206
Int. Cl. C08f 15/00
U.S. Cl. 260—878 R 5 Claims

A substantially clear resin having good impact and processability is prepared by graft polymerizing vinyl chloride-propylene copolymers with butadiene-1,3 or isoprene or mixtures thereof, alpha-methacrylonitrile or acrylonitrile and optionally a small amount of styrene and/or methyl methacrylate.

ERRATUM

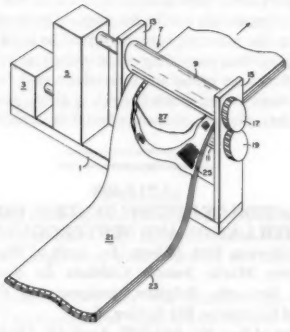
For Class 260—3 see:
Patent No. 3,715,172

3,715,414

METHOD FOR PRODUCTION OF COMPOSITE AND MODIFIED DOUBLE BASE REINFORCED CARPET ROLL GRAIN

Seiford F. Schultz, Huntsville, and Andrew B. Nix, both of Guntersville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Jan. 4, 1971, Ser. No. 103,550
Int. Cl. C06b 21/02
U.S. Cl. 264—3 R 5 Claims



A method of producing a reinforced carpet roll grain propellant by the steps including placing a reinforcement material such as fiberglass between sheets of plastic, inserting these three layers into spaced apart rollers, placing the desired

propellant composition onto the reinforced material, and then feeding the layers of plastic and reinforced material with the propellant thereon through said rollers to produce a carpet roll that has a predetermined thickness of propellant on opposite sides of the reinforced material. By this method, a propellant is made that is reinforced and flexible so that it can be rolled into a carpet roll.

3,715,415

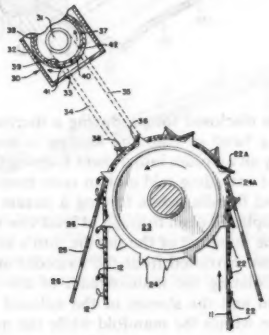
METHOD FOR THE MANUFACTURE OF A SEPARABLE FASTENER

George H. Erb, Cuttingsville, Vt., assignor to American Velcro Inc., Manchester, N.H.

Division of Ser. No. 751,831, Aug. 12, 1968, Pat. No. 3,546,754. This application Nov. 6, 1970, Ser. No. 87,438

Int. Cl. B29c *23/00*

U.S. Cl. 204—25 **8 Claims**



A hook member is formed from non-woven sheet material for use in a separable fastening device of the type having two complementary members each provided with an engaging surface having thereon a very large number of hooking elements of the hook and loop type; the members are joined by pressing the engaging surfaces together with a large number of hooks and loops becoming inter-engaged whereupon they become resistant to separation by forces generally parallel to the interface plane of the surfaces and are readily separable by peeling forces applied substantially normal to the plane. The hooks in the hook member are formed from portions of the non-woven sheet displaced out of the plane thereof into a generally upright position by the steps of displacing the portions of the sheet material, and deflecting and heat treating these portions to form the hooks.

3,715,416

FILTER START-UP IN DRY SPINNING ACRYLONITRILE COPOLYMER

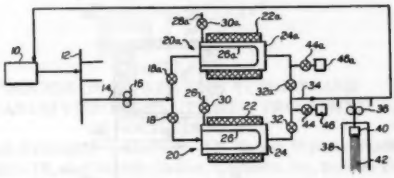
Kenneth C. Campbell, Rock Hill, S.C., and Robert R. Rhinehart, Jr., Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed June 14, 1971, Ser. No. 152,939

Int. Cl. B28b *7/04;* **D01d** *1/10*

U.S. Cl. 264—39 **9 Claims**

In dry spinning a heated solution of an acrylonitrile polymer in acetonitrile:water after passage through an apparatus comprising at least one filter, the improvement in the process of resuming flow of solution through said filter after interruption which comprises: positioning said filter in the path of flow of said solution from said supply to the spinnerette without establishing communication therebetween, filling said filter with solvent for said polymer, establishing a predetermined superatmospheric pressure-responsive normally closed outlet for solvent in said filter, either prior to or after filling said filter with solvent, heating it approximately to the temperature of said solution during filtration, establishing communication



between said supply and said filter whereby the superatmospheric pressure builds up in said filter and bleeding solvent and solution out through said outlet, continuing to bleed solution through said outlet for a period of time sufficient to reestablish equilibrium conditions with said supply, and establishing communication between said filter and said spinnerette, whereby dry spinning is resumed.

3,715,417

METHOD OF FABRICATING A BUILDING PANEL CONTAINING CELLULAR POLYURETHANE

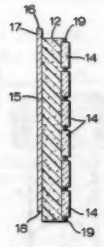
Kenneth W. Pope, Kitchener, Ontario, Canada, assignor to Du Pont of Canada Limited, Montreal, Quebec, Canada

Filed Aug. 31, 1967, Ser. No. 664,752

Claims priority, application Great Britain, Sept. 2, 1966, 39,434/66

Int. Cl. B29d *27/00*

U.S. Cl. 264—45 **7 Claims**



A prefabricated building panel having a layer of cellular plastic such as polyurethane foam, to one face of which are bonded brick-like facing elements spaced from one another. A granular material, such as sand, is adhered to and embedded in the cellular plastic between the facing elements to give the appearance of mortar between the facing elements.

3,715,418

LOW VISCOSITY MELT SPINNING PROCESS

Wilbur J. Privott, Jr., and Robert E. Cunningham, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

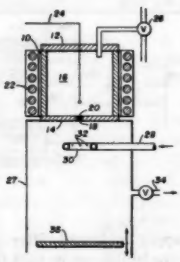
Continuation-in-part of application Ser. No. 599,539, Dec. 6, 1966. This application Oct. 2, 1969, Ser. No. 863,266

Int. Cl. B28b *3/20;* **B22d** *11/00*

U.S. Cl. 214—82 **10 Claims**

Fiber lengths are formed from an inorganic molten material having a melt viscosity-melt surface tension ratio

of not greater than one. The fibers are obtained by extruding a free falling stream from the melt film-stabilizing the stream against the effects of surface tension pending solidification, and decelerating the solidified stream at a selected point intermediate of a first point (D_o) upstream



of which attending stream deceleration causes attainment of a non-fibrous mass, and a second point (D_a) upstream of which attending stream deceleration causes disruptions in the solidified stream continuity, D_o being upstream from D_a.

3,715,419

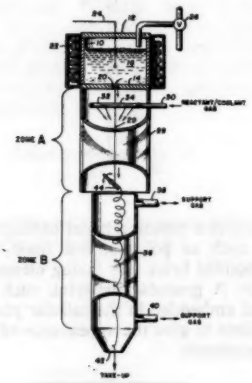
DRAG STABILIZED LOW VISCOSITY MELT SPINNING PROCESS

Wilbur J. Privott, Jr., and Robert E. Cunningham, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 680,898, Nov. 6, 1967. This application Oct. 27, 1969, Ser. No. 870,646

Int. Cl. B28b *3/20;* **B22d** *11/00*

U.S. Cl. 264—82 **7 Claims**



An improved stabilization process for forming filaments from streaming low viscosity melt materials by simultaneously preventing disruptions in the fragile, incompletely solidified portion of the stream due to the drag interaction between the stabilized stream and surrounding gaseous atmosphere and utilizing the drag to form a helical-like configuration in the solidified portion of the stream which permits applying sufficient tension thereto to enable filament take-up.

3,715,420

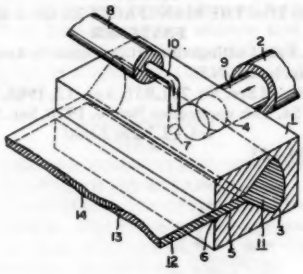
PROCESS FOR PRODUCING A THERMOPLASTIC RESIN SHEET HAVING A COLOR BAND

Hiroshi Kiyono, Higashiyama-ku, Kyoto; Junichi Nakashima; Yasuyuki Fujisaki, both of Koga-gun, Shiga-ken; Yukio Ishigaki, Otsu-shi, Shiga-ken, and Gen Endo, Kusatsu-shi, Shiga-ken, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 17, 1970, Ser. No. 55,763

Int. Cl. B29f *3/12;* **B32b** *17/06*

U.S. Cl. 264—171 **3 Claims**



A process is disclosed for producing a thermoplastic resin sheet having a band of color by feeding a molten thermoplastic resin by an extruder into a sheet-forming flat die having a manifold and extruding said molten resin from an extrusion opening of said flat die, while forcing a stream of a colored molten thermoplastic resin through at least one injection port opened into the manifold of the flat die into a main stream of the molten resin extruded from the extruder and fed to the manifold, associating the main stream of the molten thermoplastic resin and the stream of the colored molten thermoplastic resin within the manifold while the main stream is flowing in the extrusion and widthwise directions in said manifold, and extruding the associated streams from the extrusion opening of said flat die.

3,715,421

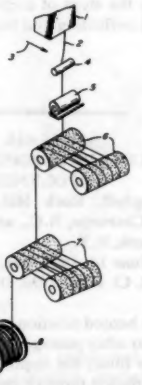
PROCESS FOR THE PREPARATION OF POLYETHYLENE TEREPHTHALATE FILAMENTS

Horst G. Martin, Zug; Bernhard Glutz, and Hans Linz, both of Lucerne, all of Switzerland, assignors to Societe de la Viscose Suisse, Emmenbruche, Switzerland

Filed April 15, 1970, Ser. No. 28,821

Int. Cl. B29f *3/00;* **D01d** *5/08, 5/12*

U.S. Cl. 264—130 **13 Claims**



A continuous spin-draw process is disclosed for preparing highly drawn polyethylene terephthalate filaments drawn at

speeds greater than 1,800 meters per minute using only one heated draw roll system without the use of any other heating device. Feed and draw rolls are provided with a surface roughness which allows a slipping of the filaments along a number of turns before they leave the feed rolls and after they arrive at the draw rolls. The filaments are partially drawn at the lower temperature of the feed rolls, drawing continues between the feed and draw rolls, and is completed at the higher temperature of the draw rolls with a total draw ratio between 5 and 8.

3,715,422

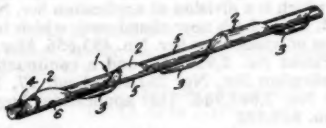
PROCESS FOR PRODUCING CRINKLED PLASTIC RIBBON

Sohinder Nath Chopra, Hawkesbury, Quebec, and Hilaire Marcel Turmel, Drummondville, Quebec, both of Canada, assignors to Chemical Limited, Montreal, Quebec, Canada

Division of Ser. No. 815,044, April 10, 1969, and a continuation-in-part of Ser. No. 558,120, June 16, 1966, abandoned. This application May 18, 1970, Ser. No. 48,752

Int. Cl. D01d *5/22*

U.S. Cl. 264—168 **11 Claims**



The present invention relates to a process for making a flat-extruded yarn or ribbon of melt-extrudable thermoplastic material having a characteristic surface configuration, and to a method and apparatus for producing such yarn or ribbon.

3,715,423

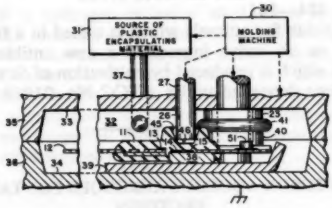
PLASTIC ENCAPSULATION OF SEMICONDUCTOR DEVICES

Thomas A. Dunn, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 761,074, Sept. 20, 1968, abandoned. This application Jan. 25, 1971, Ser. No. 109,602

Int. Cl. B29d *3/00*

U.S. Cl. 264—250 **3 Claims**



A first plastic encapsulated subassembly has a cup-shaped recess with the sides of the cup having a taper of about 30° and a heat sink opposite the cup. The assembly is placed in a cavity of a mold with a second heat sink in contact with the subassembly heat sink and resting on one face of the mold cavity. A mold pin is inserted into the cup-shaped recess, forcing the subassembly, using a precalculated and controlled deformation of the cup, heat sink and the one mold face together such that the later injected plastic encapsulating material does not flow therebetween to provide a good thermal path from the subassembly heat sink to an outer face of the completed plastic encapsulated assembly.

ERRATUM

For Class 423—235 see:
Patent No. 3,715,187

3,715,424

PROCESS OF SEPARATING YTTRIUM AND LANTHANUM THROUGH LUTETIUM FROM MIXTURES OF SUCH ELEMENTS

Ekkehard Greinacher, Ahornstr. 41, Essen; Werner Fischer, Appelstr. 18, and Martin Dahne, Callinstr. 46, both of Hannover, all of Germany

Continuation of Ser. No. 768,737, Oct. 18, 1968, abandoned. This application June 3, 1971, Ser. No. 149,757

Claims priority, application Austria, Nov. 8, 1967, A 10063/67

Int. Cl. C22b *59/00*

U.S. Cl. 423—21 **2 Claims**

Process of separating at least two of the elements yttrium and lanthanum through lutetium from a mixture of such elements by distributing the thiocyanates of the elements between an aqueous phase and an organic solvent phase. The concentration of the elements in the aqueous phase is at least 1.5 gram-atoms per liter, but preferably between 2 gram-atoms per liter and the saturation limit. The thiocyanate concentration in the aqueous phase is between 0.01 – 3 mole per liter.

3,715,425

PROCESS FOR THE MANUFACTURE OF CHROME CHEMICALS

Thomas R. Morgan; William W. Low, both of Syracuse; Christian A. Wamser, Camillus, and Charles P. Bruen, Fayetteville, all of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 82,024

Int. Cl. C01g *37/14*

U.S. Cl. 423—61 **20 Claims**

Chrome chemicals such as chromic acid (CrO_3) and alkali metal chromates and bichromates are prepared by a process which avoids the formation and treatment of "brown muds" which includes the processing steps of reacting an alkali metal bisulfate solution substantially free of trivalent chromium values with an aqueous solution of an alkaline roasted chrome ore mixture containing dissolved chrome ore values to convert the roasted mixture's chrome ore values at least in part to an alkali metal bichromate and separating said bichromate values. The alkali metal bichromate values may be reacted with a sulfuric acid to produce chromic acid. Also covered by the present invention is the removal of the chloride impurity from the bichromate values.

3,715,426

CONTINUOUS PROCESS FOR SCRUBBING H2S FROM A GAS STREAM AND SELECTIVELY PRODUCING ELEMENTAL SULFUR USING FOUR RECYCLE WATER STREAMS

Robert J. J. Hamblin, Des Plaines, Ill., assignors to Univeral Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 773,211, Nov. 4, 1968, Pat. No. 3,627,465. This application July 30, 1971, Ser. No. 167,735

Int. Cl. C01b *17/06*

U.S. Cl. 423—234 **18 Claims**

H_2S is removed from a gas stream and sulfur is selectively produced by the steps of: (1) sequentially scrubbing the gas

with a first recycle water stream containing NH_4OH and then with a second recycle water stream which is substantially NH_4OH-free to produce a treated gas stream, which is reduced in H_2S content and is substantially free of NH_3, and a rich absorbent stream containing NH_4HS; (2) catalytically reacting a portion of the rich absorbent stream and a third recycle water stream containing NH_4HS and NH_4OH with a first air stream to produce a liquid stream containing ammonium polysulfide and a gas stream containing NH_3, H_2S, H_2O and N_2; (3) catalytically reacting the liquid stream from step (2) and a fourth recycle water stream containing ammonium polysulfide with a second air stream to form a substantially sulfide-free water stream containing NH_4OH and $(NH_4)_2S_2O_3$, a gas stream containing NH_3, H_2O and N_2 and a liquid sulfur stream; (4) recovering a portion of the water stream from step (3) as at least a portion of the first recycle water stream and passing same to step (1); (5) stripping NH_3 from another portion of the water stream formed in step (3) to make a sulfide- and ammonia-free water stream containing $(NH_4)_2S_2O_3$; (6) passing a portion of the water stream from step (5) to step (1) as the second recycle water stream; (7) reacting another portion of the water stream from step (5) and another portion of the rich absorbent stream to form the fourth recycle water stream and passing same to step (3); and (8) scrubbing NH_3 and H_2S from the gas streams produced in steps (2) and (3) to form the third recycle water stream and passing same to step (2).

ERRATUM

For Class 423—24 see:
Patent No. 3,715,320

3,715,427
STABILIZED ERYTHROCYTES AND METHODS THEREFOR

Arthur Atsunobu Hirata, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 760,052, Sept. 16, 1968, abandoned, which is a continuation-in-part of Ser. No. 682,550, Nov. 13, 1967, abandoned. This application Dec. 24, 1970, Ser. No. 101,442

Int. Cl. A01n *1/00; G01n 31/00, 33/16*

U.S. Cl. 424—3 **9 Claims**

A method for obtaining an improved, stabilized aldehyde-treated erythrocyte preparation having an increased hemagglutination titer. The erythrocytes are stabilized by sequential exposure to dilute solutions of pyruvic aldehyde and formaldehyde, subjected to a freeze-thaw cycle, and stored at a temperature of −20°C. or below.

3,715,428
HAIR SPRAY UNIT CONTAINING A SOLUTION OF A POLYMERIC QUATERNARY CELLULOSE ETHER SALT

Alan R. Quasius, Arlington Heights, and Paul J. Shiman, Chicago, Ill., assignors to The Gillette Company, Boston, Mass.

No Drawing. Filed Nov. 4, 1970, Ser. No. 86,980

Int. Cl. A61k *7/00, 9/00*

U.S. Cl. 424—47 **3 Claims**

A hair spray unit containing propellant and a solution in a volatile liquid solvent of a polymeric quaternary cellulose ether salt.

3,715,429
DEFORMATION OF HAIR WITH THIOUREA DIOXIDE AND ACTIVATING AGENT THEREFOR

Robert Amon, Deceased, late of London, England, by Joy Mary Amon, administratrix, 711 N. Circular Road, and Julian Jacob Tobin, joint administrator, 223 Regent St., both of London, England

No Drawing. Continuation-in-part of application Ser. No. 634,861, May 1, 1967. This application Nov. 24, 1969, Ser. No. 879,545

Claims priority, application Great Britain, May 2, 1966, 19,256/66

Int. Cl. A61k *7/10*

U.S. Cl. 424—71 **11 Claims**

A composition based on thiourea dioxide and incorporating activating agents therefor suitable for the preparation of a substantially neutral aqueous solution for use in the treatment of hair.

3,715,430
PURIFIED OXYGEN GAS CONTAINING OZONE AND HIGHER OXYGEN POLYMERS

Edmond J. Ryan, 2322 SW. 13th St., Miami, Fla.

Continuation of application Ser. No. 438,793, Mar. 10, 1965, which is a division of application Ser. No. 26,376, May 2, 1960, both now abandoned, which in turn is a division of application Ser. No. 493,656, Mar. 11, 1955, now Patent No. 2,937,983, and a continuation-in-part of application Ser. No. 762,199, Sept. 17, 1958, now Patent No. 3,063,904. This application Aug. 4, 1969, Ser. No. 849,588

Int. Cl. A61k *27/00*

U.S. Cl. 424—127 **1 Claim**

A therapeutically active oxygen gas consisting of oxygen purified of its normal contaminants such as moisture and carbon dioxide as well as any contaminating components that may be derived from ultra-violet light generating apparatus, the purified oxygen gas being exposed to ultra-violet light in a narrow wave length sufficient to generate about 5 to 500 parts per million of ozone and higher polymeric forms of oxygen.

3,715,431
PARASITICIDE FOR ANIMALS

Yasushi Yusa, Yokohama-shi, Naotoshi Akai, Kokubunji-shi, Shinichi Kondo, Yokohama-shi, Kimio Satoh, Kawasaki-shi, and Yasuharu Sekizawa, Tokyo, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

No Drawing. Filed July 7, 1967, Ser. No. 651,713

Claims priority, application Japan, July 8, 1966, 41/44,178; Mar. 10, 1967, 42/14,717

Int. Cl. A61k *21/00*

U.S. Cl. 424—181 **5 Claims**

Parasiticide for animals which is mixed in a fodder and contains as an active ingredient a new antibiotic destomycin A which is produced by cultivation of *Streptomyces rimofaciens* deposited under ATCC No. 21066.

3,715,432
SUBMICRON AQUEOUS AEROSOLS CONTAINING LECITHIN

Edward W. Merrill, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 823,972, May 12, 1969, Pat. No. 3,594,476. This application Jan. 22, 1971, Ser. No. 109,058

Int. Cl. A61j *3/02;* **A61k** *13/00*

U.S. Cl. 424—199 **3 Claims**

Aerosols of aqueous particles of submicron diameter which are stable against evaporation and suitable to be readily transmitted to the alveoli of the lung by inspiration, may be prepared from aqueous lecithin dispersions nebulized, as by an ultrasonic nebulizer, at temperatures greater than 25° C. Lecithin aerosols thus prepared are useful for the treatment of

lung disorders, and may optionally contain other therapeutic agents such as antibiotics.

3,715,433

GROWTH PROMOTION IN SWINE

Jacob Christopher Bauernfeind, Upper Montclair, and Milan Mitrovic, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 2, 1969, Ser. No. 829,763
Int. Cl. A61k *27/00*
U.S. Cl. 424—229 **4 Claims**

Compositions and methods for promoting the growth and increasing the feed efficiency of swine, comprising orally administering to the swine a composition comprising either (a) 1-methyl-2-isopropyl-5-nitroimidazole, (b) sulfa compound potentiated with a 2,4-diamino-5-[2',4',5'-trisubstituted-benzyl] pyrimidine or (c) a mixture of (a) and (b). The method comprises feeding the swine a ration containing a sufficient amount of (a), (b) or (c) to achieve the desired effect, e.g., from about 10 grams to about 250 grams per ton, i.e., about 0.0011 part to about 0.0275 part per 100 parts by weight of feed.

3,715,434

IODOPEPTIDE ANTICOAGULANTS

Thomas J. Mende, Miami, Fla., assignor to Research Corporation, New York, N.Y.

Filed April 7, 1970, Ser. No. 26,425
Int. Cl. A61k *27/10*
U.S. Cl. 424—177 **2 Claims**

Peptides, when iodinated, exhibit very strong anticoagulant activity.

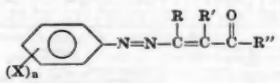
3,715,435

PHENYLAZOALKENOATE FUNGICIDAL COMPOSITIONS

Wayne N. Harnish, Medina; Robert E. Sticker, Middleport, and Glen A. Carls, Williamsville, all of N.Y., assignors to FMC Corporation, New York, N.Y.

Filed Aug. 21, 1970, Ser. No. 66,106
Int. Cl. A01n *9/20*
U.S. Cl. 424—226 **16 Claims**

As new fungicidal compositions, substituted phenylazoalkenoates of the general formula



wherein R is hydrogen or lower alkyl, R' is hydrogen or chlorine; R'' forms an ester or an amide; X is an electronegative substituent such as nitro, cyano, methylsulfonyl, carboxyl, or COOM where M is a metal cation; *n* is 1 or 2; and the substituents X may be the same or different when *n* is 2, and are in the ortho or para positions on the ring. The preparation and physical and fungicidal properties of preferred members of this class are described in detail.

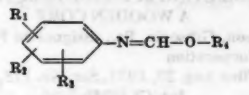
3,715,436

FORMIMIDO-ESTERS AND PESTICIDAL PREPARATIONS CONTAINING THEM

Stefan Janiak, Binningen, and Volker Dittrich, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Original application Mar. 25, 1968, Ser. No. 715,494. Divided and this application Dec. 9, 1970, Ser. No. 96,589
Claims priority, application Switzerland, Mar. 28, 1967, 4,317/67
Int. Cl. A01n *9/20, 9/24*
U.S. Cl. 424—304 **3 Claims**

The invention relates to new formimido-ester of the general formula



of which the substituents R_1 to R_4 are defined in the disclosure, and their use is pesticides, especially for combating insects, arachnoids and nematodes.

3,715,437

METHOD OF ACHIEVING AN ANTIPEPTIC ACTION IN ANIMALS WITH BIMETALLIC COMPOUNDS

Alfred Halpern, 11 Hampton Court, Great Neck, N.Y. 11020, and Ernest J. Sasmor, 245 Rumsey Road, Yonkers, N.Y. 10705

Original application Sept. 25, 1967, Ser. No. 674,051, now Patent No. 3,501,575. Divided and this application July 7, 1969, Ser. No. 872,783
Int. Cl. A61k *27/00*
U.S. Cl. 424—317 **1 Claim**

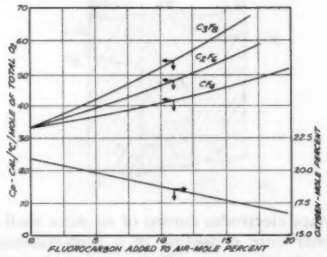
The method of achieving an antipeptic action in an animal which comprises the step of administering a compound of the formula, XAlOH2R, wherein X may be the magnesium or calcium ion and R is either the gluconic, glucuronic or galacturonic acid radical.

3,715,438

HABITABLE COMBUSTION-SUPPRESSANT ATMOSPHERE COMPRISING AIR, A PERFLUOROALKANE AND OPTIONALLY MAKE-UP OXYGEN

Clayton M. Huggett, Burke, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.

Filed July 22, 1970, Ser. No. 57,255
Int. Cl. A61k *13/00, 27/00*
U.S. Cl. 424—366 **18 Claims**



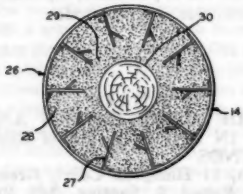
Habitable atmospheres which do not sustain combustion and which are capable of sustaining mammalian life, consisting essentially of air, a perfluoroalkane gas, which is carbon tetrafluoride (CF_4), hexafluoroethane (C_2F_6), octafluoropropane (C_3F_8), or mixtures thereof, and make-up oxygen, as required, to provide, together with the oxygen present in the air, sufficient total oxygen to sustain mammalian life.

A method for preventing and controlling fire in enclosed air-containing, mammalian-habitable compartments comprising introducing CF_4, C_2F_6, C_3F_8, or mixtures thereof, and additional make-up oxygen as required.

3,715,439
ELECTRIC SMELTING FURNACE ELECTRODE HAVING A WOODEN CORE

John A. Persson, Gibsonia, Pa., assignor to Pennsylvania Engineering Corporation

Filed Aug. 27, 1971, Ser. No. 175,496
Int. Cl. H05b 7/06
U.S. Cl. 13—18 7 Claims

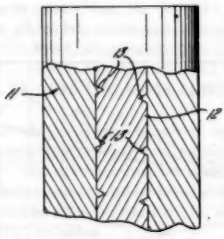


One or more wooden logs are introduced into the central region of smelting furnace electrodes as they are being formed of paste to produce an electrode that has a non-conductive center and an outer conducting sheath of baked and hardened carbonaceous material.

3,715,440
ELECTRIC ARC STABILIZATION IN ELECTRIC ARC MELTING USING CARBON ELECTRODES

Alfred Gordon Evans Robiette, Nechells, Birmingham 7, England, assignor to Foseco International Limited

Division of Ser. No. 791,505, Jan. 5, 1969, abandoned, which is a continuation-in-part of Ser. No. 573,867, Aug. 23, 1966, Pat. No. 3,461,339. This application April 1, 1971, Ser. No. 130,431
Claims priority, application Great Britain, Oct. 1, 1968, 46,525/68
Int. Cl. H05b 7/06
U.S. Cl. 13—18 14 Claims



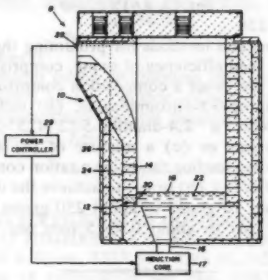
Arc furnace electrodes consist of an outer shell of carbon and an inner core consisting of a carbonaceous filler, a promoter material, e.g., an alkali metal oxide, carbonate or halide, and a carbonaceous binder such as pitch or tar.

3,715,441
INDUCTION FURNACE WITH THERMOCOUPLE ASSEMBLY

Henry F. Collins, 917 Alamo, Garland, Tex.

Filed July 26, 1971, Ser. No. 166,009
Int. Cl. F27d 21/04; H05b 5/00
U.S. Cl. 13—26 5 Claims

An induction furnace for melting metal has a built-in thermocouple assembly for continuously measuring the temperature of the molten metal. A power controller then adjusts the power to the furnace to maintain a predetermined temperature. The thermocouple assembly includes a refractory substrate which forms a portion of the furnace lining partially coated with thin strips of two thermoelectric materials so as to form a thermocouple junction. The refractory substrate and

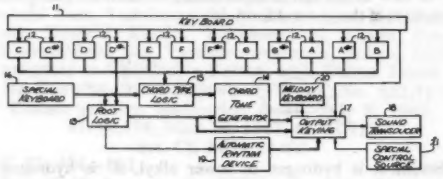


the strips of thermoelectric materials are covered with a protective layer of the same refractory material as the substrate. Electrical leads are attached to the assembly and are in contact with the strips of thermoelectric material. An alternative embodiment utilizes a similarly constructed thermocouple which is immersed in the molten material for intermittent measurements.

3,715,442
CHORD TONE GENERATOR CONTROL SYSTEM

Alfred B. Freeman, 20418 Seaboard Road, Malibu, Calif.

Filed Dec. 15, 1970, Ser. No. 98,384
Int. Cl. G10b 1/00
U.S. Cl. 84—1.01 25 Claims



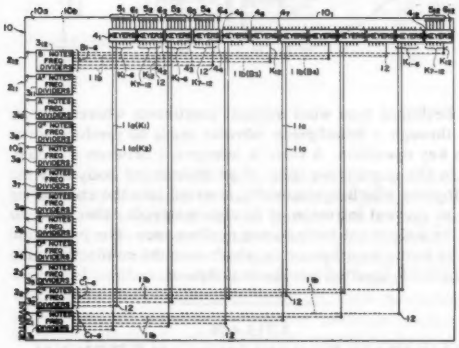
Apparatus for playing chords and bass which has a chord tone generator tuned for different root notes by logic devices sensing the playing keys actuated and controlled for different chord types by other logic devices responsive to the first logic devices and actuated playing keys. Specially controlled keyers respond to the root note and the highest pitch playing key actuated to sound sets of outputs in pitch locations according to selected relations that include close and open harmony and direct correspondence. The keyers further pass outputs within a given pitch range to a modulator driven by an automatic rhythm device to sound them in rhythmic patterns. The automatic rhythm device further controls the sounding of other outputs one at a time in a bass register. Special controls are also used to tune for root, control for type, and select pitch locations for sounding.

3,715,443

WIRING SYSTEM BETWEEN SOUND SOURCE CIRCUITS AND KEYER CIRCUITS IN AN ELECTRONIC MUSICAL INSTRUMENT

Kazukiyo Ishimura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 30, 1971, Ser. No. 203,232
Claims priority, application Japan, Dec. 3, 1970, 45/111040; Dec. 3, 1970, 45/107123
Int. Cl. G10h 1/00
U.S. Cl. 84—1.01 3 Claims



The wiring system of this invention is for connecting a number of integrated sound source circuits with the corresponding number of integrated keyer circuits in an electronic musical instrument, and is realized on a single piece of a rectangular wiring substrate. More particularly, the wiring system is characterized in that the sound source circuits are sequentially arranged along one arbitrary side of the rectangular wiring substrate while the keyer circuits are sequentially arranged along the second side of the substrate adjacent to said first side; that conductive members corresponding, in number, to the output terminals of the sound source circuits are extended on one surface of the substrate, from the output terminals toward the side facing said first side; that conductive members corresponding, in number, to the input terminals of the keyer circuits are extended, on the other surface of the substrate, from the input terminals toward the side facing said second side up to the points where the conductive members from the output terminals are terminated on the one side of the substrate; and that at those points the conductive members on both surfaces of the substrate are, respectively, connected by coupling means.

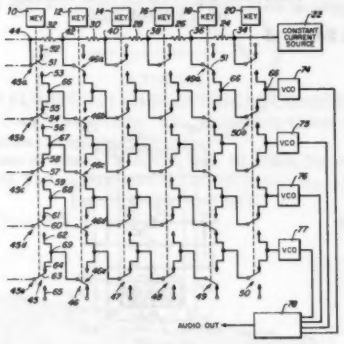
3,715,444

SWITCHING SYSTEM FOR KEYBOARD

Alan R. Pearlman, Newton Highlands, Mass., assignor to Tonus, Inc., Newton, Mass.

Filed Jan. 4, 1971, Ser. No. 103,493
Int. Cl. G10h 1/00
U.S. Cl. 84—1.01 1 Claim

A priority switching system for use with a keyboard of an electronic musical instrument comprising a plurality of input terminals having corresponding voltages applied thereto, a switching matrix including a plurality of linear switch arrays with each array responsive to operation of a corresponding key, and a multiplicity of voltage controlled oscillators coupled to the switching matrix. In the switching system the voltage controlled oscillators and the input terminals are selectively interconnected by the switching matrix on a priority basis so that the uppermost key, for example, is assigned to a first voltage controlled oscillator, and the next key, which need not be the next adjacent key, is assigned to a second voltage controlled oscillator, etc. In another embodiment,



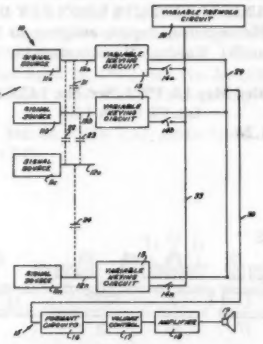
separate oscillators are coupled to each of the plurality of input terminals and a plurality of audio processing channels are coupled to the switching matrix.

3,715,445

MUSICAL INSTRUMENT HAVING DC-KEYING CIRCUIT

Alberto E. Kniepkamp, Chicago, Ill., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.

Filed April 30, 1971, Ser. No. 138,880
Int. Cl. G10h 1/04
U.S. Cl. 84—1.13 13 Claims



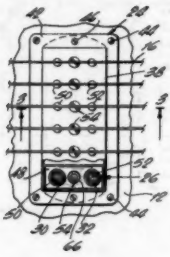
A musical instrument, such as an electronic organ, includes normally constantly running tone-signal sources which are coupled by key-operated switches to a transducer for converting the tone-signals into audible sounds by means of a DC-keying potential. The waveform of the tone signal comprises pulses which are modulated in shape by the DC-keying circuit as follows: at the onset or attack of the tone, the amplitudes of successive pulses are unidirectionally increased and the duration of said successive pulses are simultaneously unidirectionally decreased from a predetermined duration or duty cycle to a substantially shorter duration or duty cycle, while the reverse takes place at the decay of the tone. There is no modulation of frequency. By this circuit, the harmonic content of the tone-signal is varied in such a manner as to electronically closely simulate certain voices as brass, in a particularly realistic manner.

3,715,446

MAGNETIC PICKUP FOR STRINGED MUSICAL INSTRUMENTS

Frank Joseph Kosinski, Hauppauge, N.Y., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed June 22, 1971, Ser. No. 155,528
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.15 **8 Claims**



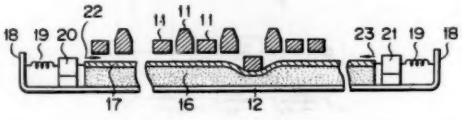
A magnetic pickup for stringed musical instruments has a balanced coil assembly for each string. Each assembly includes a bar magnet supporting a pair of pole pieces, each pole piece having a separate coil wound thereon. Each coil assembly is provided with an adjustment device for individually balancing the output of each string.

3,715,447

ELECTRONIC MUSICAL INSTRUMENT WITH A KEYBOARD DEVICE CAPABLE OF PRODUCING SPECIAL MUSICAL EFFECTS UPON KEY DEPRESSION

Junji Ohno, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed May 13, 1971, Ser. No. 143,032
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 **19 Claims**



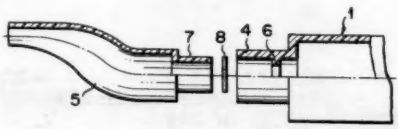
In an electronic musical instrument, a keyboard device comprises a flexible and substantially non-extensible tape elastically supported on a keyboard frame below playing keys, and a first and a second detectors at both ends of the tape to generate electrical signals each having an amplitude corresponding to the amount of displacement of each tape end. The electric signals from the first and second detectors are supplied to a signal adder and a signal substractor, the adder giving out signals when the both tape ends move inward and the substractor giving out signals when one tape end moves inward and the other end outward. The output from the adder is supplied to a volume control circuit, while the output from the substractor is supplied to a vibrato effect producing circuit. On this instrument, a downward depression of the key produces an expression control effect, and a lateral movement of the key produces a vibrator effect.

3,715,448

KEYBOARD TYPE WIND MUSICAL INSTRUMENT HAVING REMOVABLE MOUTHPIECE SECURING REMOVABLE AIR FILTER

Masaji Itoh, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed July 12, 1971, Ser. No. 161,640
Claims priority, application Japan, July 15, 1970, 45/61503
Int. Cl. G10d *11/00*
U.S. Cl. 84—375 **10 Claims**



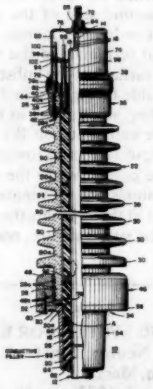
A keyboard type wind musical instrument wherein an air flow through a mouthpiece vibrates reeds to produce tones upon key operation. A filter is interposed between a projection in the connecting tube of an instrument body and the mouthpiece which is removably inserted into the connecting tube to prevent intrusion of foreign materials other than air into the instrument body during performance. The projection may be in the mouthpiece, in which case the connecting tube is detachably inserted into the mouthpiece.

3,715,449

FLUID FILLED HIGH VOLTAGE CABLE TERMINAL APPARATUS

Francis V. Cunningham, Western Springs, and Cyril V. Miller, Arlington Heights, both of Ill., assignors to Joslyn Mfg., and Supply Co., Chicago, Ill.

Continuation of Ser. No. 790,815, Jan. 13, 1969, abandoned.
This application April 1, 1971, Ser. No. 130,425
Int. Cl. H02g *15/22*
U.S. Cl. 174—11 BH **10 Claims**



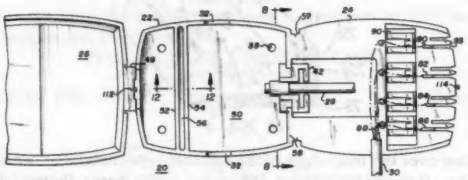
A terminal apparatus for use with insulated power cable comprising a rigid housing having an elongated bore for receiving a terminal end portion of the cable, and an elastomeric sealing means at one end of the bore. The sealing means extends into the bore from said one end towards the opposite end for a distance substantially less than the length of the bore, and the remaining portion of the bore is filled with dielectric insulating fluid and a load bearing insulation system that maintains the sealing means in air-free sealing engagement between the bore and the cable regardless of service temperature variations.

3,715,450

JUNCTION BOX

Harold W. Martin, Warren, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed March 21, 1972, Ser. No. 236,689
Int. Cl. H01r *13/46*
U.S. Cl. 174—59 10 Claims



A junction box for the termination tapping or splicing or electrical conductors is formed of three interleaved portions; a cover portion, an intermediate portion and a base portion. Mounted upon one surface of the intermediate portion are a plurality of conductor connectors each capable of receiving electrical conductors without piercing the insulation thereon and making electrical contact therewith. Such connectors are provisioned for receiving and making electrical contact with additional electrical conductors having terminal thereon such as to provide a conductive path between conductors within the insulation piercing portion and that created by a terminal. Straining relief means are provided adjacent the free ends of the conductors place in the insulating piercing portion of the connectors for holding and aligning such conductors prior to, during, and after the insulation piercing operation has taken place. Additional straining relief devices may be provided adjacent the entry to the conductor connectors so that unwanted removal of the conductors from such connectors may not be made.

3,715,451

SUPERCONDUCTOR STRUCTURE, AND METHOD OF MAKING THE SAME

Alfred Paul Hammer, 107 Avenue Victor Hugo, Paris 16 eme; Alexis Charles Entz, 16, Aliee du Haras, 92 Vaucresson, and Claude Levaire, 12, Place St. Momble, 02 Chauny, all of France

Division of Ser. No. 861,910, Sept. 29, 1969, Pat. No. 3,626,585. This application Sept. 14, 1971, Ser. No. 180,463
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 C 5 Claims

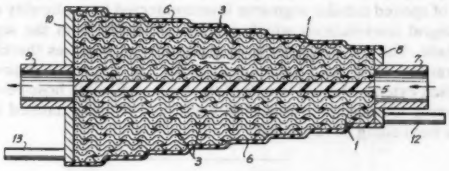
An elongated metallic tube has secured therein, with substantial line contact, a sheathed filamentary superconductor, having an outside diameter much less than the inside diameter of the tube; preferably the sheath metal and the metal of the tube are the same (for example copper, aluminum, or alloys thereof). According to the method, a long band is provided along the length of which the superconductor is first bonded, for example by welding, or fusing of the sheath metal to the band; thereafter, the band is folded and formed into the tube, the lateral edges of the band being seamed together to form a fluid tight seal for example by welding, cold flowing or the like.

3,715,452

POROUS FLUID COOLED ELECTRICAL CONDUCTORS

Hugh M. Long, Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 875,326, Nov. 10, 1969, Pat. No. 3,636,620. This application Jan. 21, 1972, Ser. No. 219,714
Int. Cl. H01b *7/34, 5/00*
U.S. Cl. 174—15 C 8 Claims



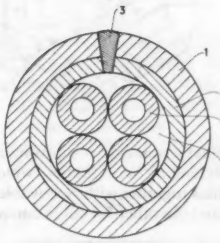
Fluid cooled, high current capacity electrical conductors manufactured by spirally rolling or winding porous metal sheet into a desired shape.

3,715,453

CRYOGENIC CONNECTION ENCLOSURE

Marcel Aupoix, Paris, and Francois Moisson-Franckhauser, Bretigny-sur-Orge, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed April 20, 1972, Ser. No. 246,018
Claims priority, application France, April 28, 1971, 7115182
Int. Cl. H01b *7/34*; H01v *11/00*
U.S. Cl. 174—15 C 4 Claims



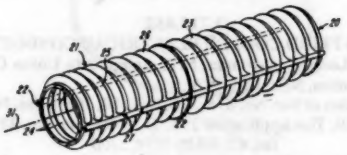
Cold enclosure having a tubular shape, surrounding the conductors of a cryogenic connection, consisting of two layers of composite material, joined together by a metallic connection, an outer cover made of an iron and nickel alloy in which the proportion of nickel comprises between thirty and forty per cent, and an inner layer of copper or aluminum, this inner layer preventing the generating of alternating induced fields in the outer cover, which is magnetic.

3,715,454

HOSE CONSTRUCTION

Donald L. Kleykamp, Springboro, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 3, 1972, Ser. No. 214,810
Int. Cl. F16l *11/12, 11/10;* **A47l** *9/24*
U.S. Cl. 174—47 **22 Claims**



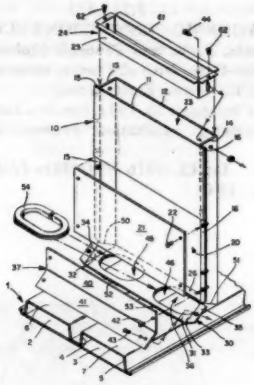
An elongated differential fluid pressure formed flexible hose is provided and has an inner portion defined by a plurality of spaced tubular segments interconnected by a plurality of integral convolutions which extend outwardly from the segments. The convolutions have a plurality of recesses therein arranged in aligned relation to define at least one groove which extends the full length of the hose. A flexible hose-reinforcing member is arranged in each groove and attached to the hose along its full length.

3,715,455

CELL TO CABINET CONNECTOR

John P. Casto, Vienna, W. Va., assignor to Textron Inc., Providence, R.I.

Filed March 16, 1972, Ser. No. 235,265
Int. Cl. H02g *3/04*
U.S. Cl. 174—48 **3 Claims**



A cell-to-cabinet connector comprising a vertical riser and an outwardly extending foot section which enhances cable pulling capabilities together with removable access plates, one for installation and the other for cable connection.

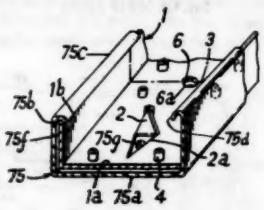
3,715,456

JOINTING CLIPS FOR INSULATED ELECTRIC WIRES

Arthur M. Faulkner, Ilford, England, assignor to The Plessey Company Limited, Ilford, Essex, England

Continuation of Ser. No. 27,514, April 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 732,602, May 28, 1968, Pat. No. 3,517,804. This application Oct. 29, 1971, Ser. No. 193,916
Int. Cl. H01r *5/10*
U.S. Cl. 174—84 C **5 Claims**

Channel-type wire-piercing jointing clips are inserted with a close fit in an extruded channel of resilient insulating material whose flanges are doubled-back inwardly in U-formation at their free edges so that the metal clips can be inserted by being pressed into the insulating channel from its open side until the doubled-back edge portions of the insulating snap into position over the free edges of the channel-type metal clip, which they then retain against lifting out while being themselves retained against separation of the insulating wall portions after crimping.

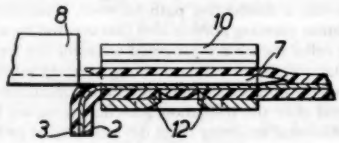


3,715,457

TWO PIECE FLAT CABLE CONNECTOR

Wladimiro Teagno, and Luigi Campari, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 9, 1971, Ser. No. 151,404
Claims priority, application Italy, June 30, 1970, 26773 A/70
Int. Cl. H01r *5/00*
U.S. Cl. 174—88 R **1 Claim**



A bipartite connector for a flat cable conductor comprises a first element having a lance portion and an electrical contact portion; a second element of generally channel-shaped cross-section comprising a base and two side walls, an integral tongue being struck from the base into the channel. To form a connection, the lance portion of the first element is caused to penetrate the top surface insulation of a flat conductor to contact the conductor longitudinally of the cable and the edges of the side walls of the second element are then caused to pierce the insulation lands laterally of the flat conductor and to be bent inwardly to contact the lance portion of the first element and clamp the lance portion and the flat conductor between the edges and the base.

3,715,458

ELECTRICAL CABLE STRUCTURE

Lowell D. Bayes, and Robert B. Cole, both of Richmond, Ind., assignors to Belden Corporation, Chicago, Ill.

Filed Nov. 1, 1971, Ser. No. 194,743
Int. Cl. H01b *7/04*
U.S. Cl. 174—113 R **3 Claims**

An electrical cable structure is described in which two separate cables are enclosed within a single extruded jacket.

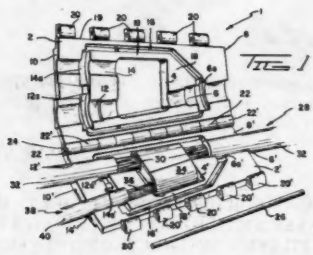
The jacket includes a recess extending along its outer surface equidistant from and parallel with the first and second cables. The recess is of a configuration to form a retainer for a further cable inserted in the recess.

3,715,459

CABLE COUPLING COVERING AND MOISTURE BARRIER

Norman Edwin Hoffman, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 15, 1971, Ser. No. 162,808
Int. Cl. H02g 15/08
U.S. Cl. 174—138 F 1 Claim



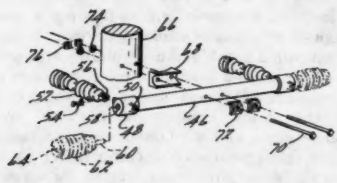
A two-piece hinged plastic covering forming an enclosure for a cable coupling. At least two cable ends protrude through the covering into the enclosure. The covering includes an interior channel encircling the coupling with additional portions of the channel diametrically encircling each moisture impervious sheath provided over each cable. An inlet is provided in the covering and in communication with the channel to allow injection of a flowable curable sealant which completely fills the channel to provide a continuous encircling band of moisture impervious material completely encircling the coupling and the moisture impervious sheaths on the protruding portions of the cables. The sealant may include a mild etchant such as acetic acid for partially softening and roughening the covering material and the moisture impervious sheaths of the protruding cable ends. The covering is of two-piece construction latched together by a rod inserted between aligned eye portions respectively connected to the cover portions. Accordingly, no specialized tooling is needed for latching the cover plate pieces together. Additionally, the sealant material may be introduced with a standard caulking gun, further eliminating the need for specialized tooling.

3,715,460

TUBULAR DEADEND SUPPORTS

Ernest A. Elliott, Detroit, and Randolph A. Pasen, Dearborn Heights, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed June 11, 1971, Ser. No. 152,113
Int. Cl. H01b 17/14; H02g 7/20
U.S. Cl. 174—158 R 8 Claims



Tubular deadend supports are constructed from elongated tubular members, preferably formed of fiberglass reinforced plastic material provided adjacent their outer ends with metallic mounting members adapted to be engaged by line insulators. For heavy duty the mounting members are arranged to support the insulators extending at 90° to the tubular member. For light duty the mounting members provide for extension of the insulators beyond the end of the tubular members.

ERRATUM

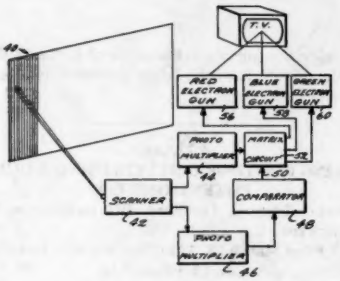
For Class 174—28 see:
Patent No. 3,715,532

3,715,461

COLOR INFORMATION ON BLACK AND WHITE FILM

Thomas F. Hanlon, 337 Tremont Avenue, Fort Lee, N.J.

Filed Oct. 28, 1970, Ser. No. 84,570
Int. Cl. H04n 9/02
U.S. Cl. 178—5.2 R 13 Claims



A method and apparatus for recording and reading out programmed color information on black and white film and black and white film with such information coded thereon. In one embodiment, a line screen or filter having a number of sets of contiguous red, green and blue lines of differing width is placed atop a piece of black and white film to record a color coded image. After development, the film can be scanned and the color associated with a line being scanned ascertained and employed to operate an electron beam for producing the proper color or producing a laser beam of the proper color by the width of the scanned line.

3,715,462

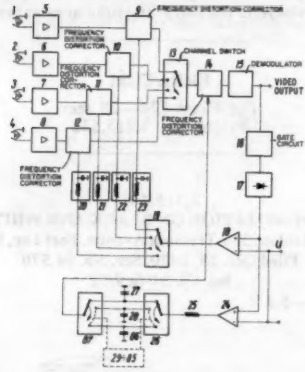
METHOD AND CIRCUIT ARRANGEMENT FOR REGULATING THE AMPLITUDE OF THE COLOR SYNCHRONIZING SIGNAL

Gerhard Krause, Ebersberg/Munich, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Aug. 31, 1970, Ser. No. 68,259
Claims priority, application Germany, Sept. 2, 1969, P 19 44 37.8
Int. Cl. H04n 5/78
U.S. Cl. 178—5.4 CR 3 Claims

A method for controlling the amplitude of the color synchronizing signal in color television signals taken from a record carrier, wherein amplitude deviations from the nominal value occur which exhibit a periodically recurring component, wherein there is derived from the color synchronizing signal a control voltage corresponding to the deviation of the amplitude of the color synchronizing signal from the nominal value, such control voltage being delivered through a low pass filter, and at the same time, in respect of each of those lines for which the periodically recurring component of the deviations is substantially equal, the control voltage is averaged over a plurality of periods of the periodically recurring component, and the mean values thus ob-

tained, and the control voltage delivered through the low pass filter is used to influence the frequency response of the taken



off color television signals in the sense of reducing the deviations in the amplitude of the color synchronizing signal from the nominal value.

3,715,463

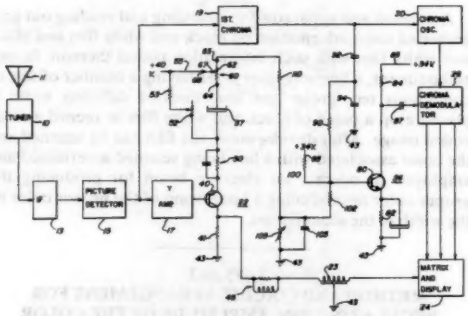
TRACKING CONTROL CIRCUITS USING A COMMON POTENTIOMETER

Lester Tucker Matzek, Lombard, Ill., assignor to Warwick Electronics Inc.

Filed March 18, 1971, Ser. No. 125,564

Int. Cl. H04n *9/12*

U.S. Cl. 178—5.4 MC **9 Claims**



Simultaneously tracking chroma and contrast controls in a color television receiver use a common potentiometer having a wiper connected to a source of reference potential. One end of the potentiometer resistor is AC coupled to a luminance amplifier, and the other end is directly coupled to a DC bias circuit for a chroma amplifier. As the wiper is adjusted, the contrast of the luminance signal and the chroma level change in corresponding directions.

3,715,464

HIGH VOLTAGE HOLD-DOWN CIRCUIT

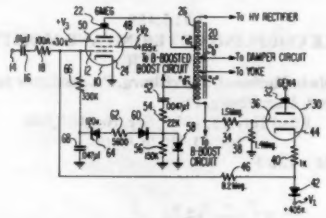
Gene Karl Sendelweck, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1971, Ser. No. 147,876

Int. Cl. H04n *9/16; 5/68*

U.S. Cl. 178—5.4 R **5 Claims**

Loss of high voltage regulation in a television receiver can cause an increase in the ultor voltage developed for its picture tube and an increase in the possibility of X-radiation. The described circuit senses the loss of such regulation by detecting a voltage pulse developed in the flyback transformer and by changing the bias on the horizontal output tube, in



response, so as to form a closed-loop feedback system which maintains normal high voltage operation whenever such regulator circuit failure occurs.

3,715,465

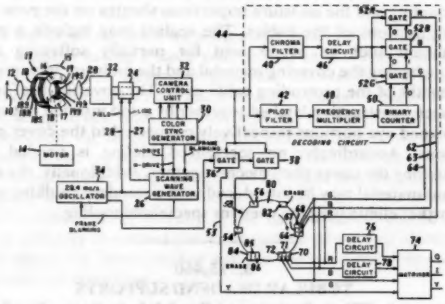
APPARATUS FOR DEVELOPING SIMULTANEOUS COLOR TELEVISION SIGNALS INCLUDING A STRIPED COLOR FILTER CONSTRUCTED TO GENERATE A PILOT SIGNAL FOR COMPONENT VIDEO SIGNAL SEPARATION

Renville H. McMann, Jr., 27 Whitney Avenue, New Canaan, Conn.

Continuation-in-part of Ser. No. 829,038, May 29, 1969, abandoned. This application April 23, 1971, Ser. No. 136,895

Int. Cl. H04n *9/06*

U.S. Cl. 178—5.4 ST **16 Claims**

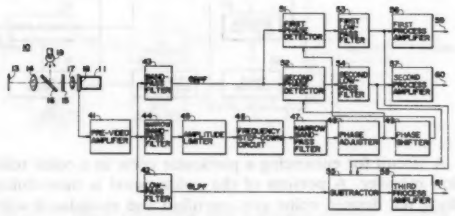


As described herein, a chrominance television signal containing separable color component portions, together with a square wave pilot signal, and a luminance signal are developed either successively by a singular scanning device operating in conjunction with a suitable optical filtering arrangement or simultaneously by a pair of scanning devices also operating in conjunction with a suitable optical filtering arrangement. The pilot signal is separated from the color component portions of the chrominance television signal and then employed to separate the color component portions. Where the chrominance signal and the luminance signal are developed successively, the separated color component portions and the luminance signal are alternately delayed for selected periods of time to align in time the luminance signal and the color component portions. Thereafter, the luminance signal and the color component portions of the chrominance signal are combined to produce conventional NTSC luminance and chrominance signals.

3,715,466
COLOR TELEVISION CAMERA EQUIPMENT

Yoshitero Karato, Tokyo, Japan, assignor to Shiba Electric Co., Ltd., Chiyoda-ku, Tokyo, Japan

Filed Dec. 2, 1970, Ser. No. 94,324
Claims priority, application Japan, Dec. 3, 1969, 44/96480
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST 10 Claims

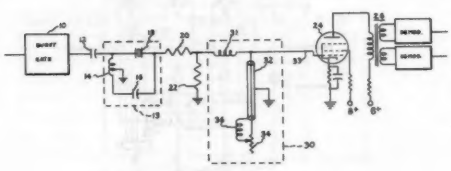


A striped color filter assembly is used which consists of at least two striped color filter elements capable of preventing the transmission of at least one color by one filter element and another color by another filter element in light from a subject to be televised. The strips of one of the color filter elements are positioned out of phase relative to those of the other color filter substantially by one-fourth pitch. The striped color filter assembly is located between a subject and a photoelectric effect plate of an image tube. The harmonic component of one color signal component is used as the fundamental frequency of the carrier. A plurality of color signals may be obtained from the single image pick up tube.

3,715,467
TINT CONTROL FOR COLOR TELEVISION RECEIVER

Larry Eugene Goodson, Portsmouth, Va., assignor to General Electric Company

Filed Nov. 13, 1970, Ser. No. 89,413
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 HE 5 Claims

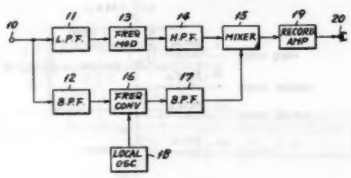


A phase shifting device used in conjunction with a reference oscillator providing a reference signal for demodulating chroma signals in a color television receiver. A first inductor is connected in series between a reference oscillator and an amplifier stage, and a capacitor and the series combination of a variable resistance and an inductor is connected between a point of reference potential and the intersection of the first series inductor and the amplifier means. Changes in the value of the variable resistance cause the phase of signals transmitted to the amplifier means to vary.

3,715,468
COLOR VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

Mitsuo Fujita, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 12,301, Feb. 18, 1970. This application Nov. 10, 1970, Ser. No. 88,350
Claims priority, application Japan, Feb. 21, 1969, 44/12554; Nov. 11, 1969, 44/89730
Int. Cl. H04n 5/76
U.S. Cl. 178—5.4 CD 14 Claims

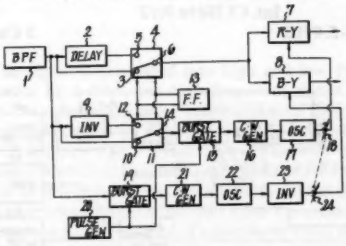


In a color video signal recording and reproducing system, a color video signal is separated into a luminance signal and a chrominance signal. A frequency modulated luminance signal is superimposed on a frequency converted chrominance signal. This superimposed signal is recorded on a magnetic medium and reproduced therefrom. The chrominance signal is converted into a signal having a frequency which makes beats inconspicuous. A signal, which is in opposite phase to the beats, is produced in order to eliminate the beats which are produced in the recording and reproducing processes. The opposite phase signal are added to the luminance signal on either the recording side or the reproducing side of the system.

3,715,469
COLOR TELEVISION RECEIVER

Hideshi Tamaru, Kanagawa, and Yoshio Ishigaki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 11, 1971, Ser. No. 152,255
Claims priority, application Japan, Nov. 17, 1970, 45/101287
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 P 22 Claims

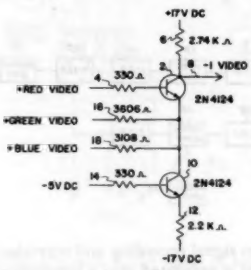


A decoding system for PAL television signals. One line of chrominance information is applied to synchronous demodulators and, by means of a switching circuit and delay means, the same line, delayed one line interval, is again applied to the same demodulators. The reference sub-carrier generating means to be controlled by synchronizing color bursts is switched to be controlled, on alternate lines, first by direct burst signals and then by inverted burst signals so that the phase of the reference sub-carrier signal will be between the phases of the controlling signals and will reverse polarity between lines. The phase of the reference sub-carrier signal may be adjustable for hue control.

3,715,470
COLOR TELEVISION CAMERA ENCODER MATRIX WITH SUMMATION OF TWO COLOR VIDEO CURRENT SIGNALS AND A CONSTANT CURRENT SIGNAL

Philip V. C. Craig, Salt Lake City, Utah, assignor to Telemation Inc., Salt Lake City, Utah

Filed March 29, 1971, Ser. No. 129,076
Int. Cl. H04n 9/52
U.S. Cl. 178—5.4 R 6 Claims

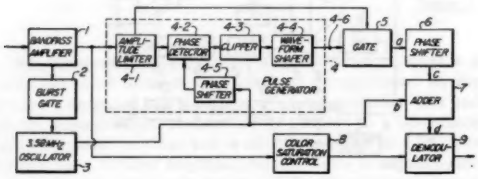


A method and apparatus for encoding color information from the video signals of a color television camera comprising a matrix including a current summing transistor which is supplied by a constant current source and two color signals which are applied in parallel with each other and with the constant current source. The third color signal is applied to vary the bias of the summing transistor in a manner to cause variations in the currents summed from the first two color signals. Identical circuits may be employed with only minor changes for encoding to derive both the I and Q video signals.

3,715,471
COLOR TELEVISION RECEIVER

Ryuhei Nakabe, Hirakata; Seiji Fujisawa; Yasuhiro Sugihara, both of Osaka, and Norio Meki, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 9, 1970, Ser. No. 79,368
Claims priority, application Japan, Oct. 15, 1969, 44/82836; Oct. 15, 1969, 44/82838; Dec. 2, 1969, 44/97412
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 HE 5 Claims

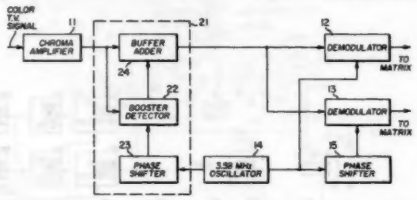


In a television receiver which receives color television signals including a carrier chrominance signal; in order to compensate for the out-of-phase condition of a carrier chrominance signal and errors in hue in broadcasting, transmitting and receiving systems, a pulse timed to a signal of a specified phase angle and phase width among carrier chrominance signals is generated and used as a reference signal for continuously or partially phase-shifting a 3.58 MH_z continuous wave, thereby securing a specified hue of demodulated color signals.

3,715,472
COLOR EMPHASIS CIRCUIT FOR TV RECEIVERS

James E. McTaggart, Malibu, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Jan. 13, 1971, Ser. No. 106,096
Int. Cl. H04n 9/12
U.S. Cl. 178—5.4 HE 5 Claims

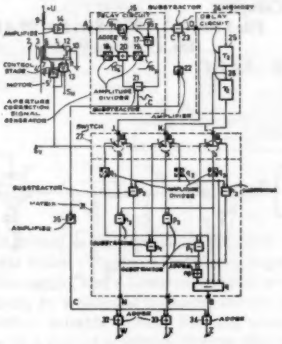


A circuit for enhancing a particular color in a color television receiver. A portion of the color signal is demodulated along the desired color axis, rectified and modulated with a phase controlled reference signal of like frequency. The signal so processed is added to the original color signal for normal demodulation. In a preferred version the color signal is applied through a diode to the base of a transistor having a threshold between the peak voltage appearing at the base with no color signal present and the peak voltage appearing at the base in the presence of a color signal in phase with the reference signal. The output signal of the transistor is then added back to the color signal to provide the enhanced color signal.

3,715,473
FIELD-SEQUENTIAL COLOR TELEVISION CAMERA INCLUDING A COLOR FILTER AND ONE CAMERA TUBE

Sing Liong Tan, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed March 22, 1971, Ser. No. 126,693
Claims priority, application Netherlands, April 18, 1970, 7005645
Int. Cl. H04n 9/06, 9/42
U.S. Cl. 178—5.4 ST 10 Claims



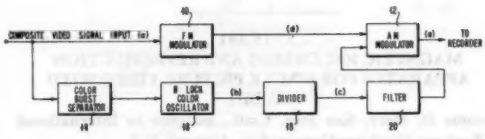
A field-sequential color television camera including one camera tube and a color filter. The camera tube is coupled to an aperture correction signal generator and a field-sequential simultaneous converter. The aperture correction signal is added to the picture signal of the camera tube in such a manner that a frequency restricted picture signal providing a poorly detailed image upon display is applied to a memory in the converter. The aperture correction signal which is field-sequential and is maintained field-sequential is added for the purpose of aperture correction to the frequency-restricted picture signals provided simultaneously by the converter.

3,715,474

COLOR VIDEO RECORDING AND PLAYBACK SYSTEM

Richard W. Calfee, San Jose, and Emil Hopner, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1967, Ser. No. 693,326
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 CD 4 Claims



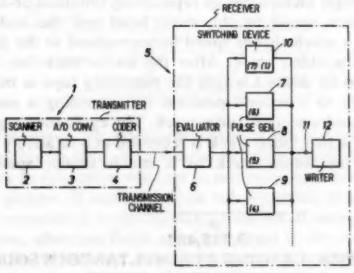
A color video recording and playback system employs a continuous sinusoidal subharmonic of the color subcarrier signal, which is used to amplitude modulate a frequency modulated video signal during the record mode, and is retrieved during playback for synchronization and phase correction of the color signal.

3,715,475

METHOD AND APPARATUS FOR ELECTRICALLY TRANSMITTING PICTURES

Dieter Prause, Esslingen/Neckar, and Rolf Sost, Stuttgart, both of Germany, assignors to Robert Bosch Elektronik GmbH, Berlin, Germany

Filed April 27, 1971, Ser. No. 137,757
Claims priority, application Germany, April 28, 1970, P 20 20 639.7
Int. Cl. H04n 1/02, 7/12
U.S. Cl. 178—5 1 Claim



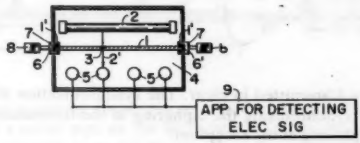
Apparatus for transmitting pictures by scanning the picture at the transmitting end to produce a voltage proportional to the brightness value of each picture element, associating the voltage for each element with a predetermined signal corresponding to the amplitude range in which that voltage lies, transmitting the predetermined signal, and, at the receiving end causing each signal to actuate a corresponding pulse sequence whose pulse duration to the pulse interval ratio is proportional to the voltage range with which its signal is associated.

3,715,476

METHOD AND APPARATUS FOR DETECTING PINHOLES ON SHEET ARTICLES

Tetsuo Watanabe, and Shinya Hashirizaki, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 14, 1970, Ser. No. 2,724
Claims priority, application Japan, Jan. 16, 1969, 44/3004; Aug. 1, 1969, 44/61345
Int. Cl. H04h 7/02
U.S. Cl. 178—6 9 Claims



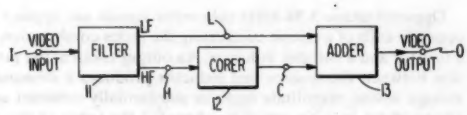
Method and apparatus for detecting pinholes and edge cracks in such sheet articles as paper, rubber sheet and metal sheets by using such detection facilities as a television camera.

3,715,477

VIDEO SIGNAL NOISE-LIMITING APPARATUS

Charles Langdon Olson, Oaklyn; John Francis Monahan, Moorestown, and Robert Adams Dischert, Burlington, all of N.J., assignors to RCA Corporation

Filed March 11, 1971, Ser. No. 123,233
Int. Cl. H04n 9/02, 5/14
U.S. Cl. 178—5.4 R 13 Claims



The signal is separated into high and low frequency constituents by a filter, the high frequency signal constituent is cored to remove low amplitude excursions therefrom, and the cored high frequency signal constituent is combined with the low frequency signal constituent in suitable proportions to produce a resultant signal having an improved signal-to-noise ratio. In one form of the apparatus the video signal is the luminance component. In another form the noise-limiting is applied to each of a plurality of component color signals. A composite color television video signal is noise-limited by further forms of the apparatus.

3,715,478

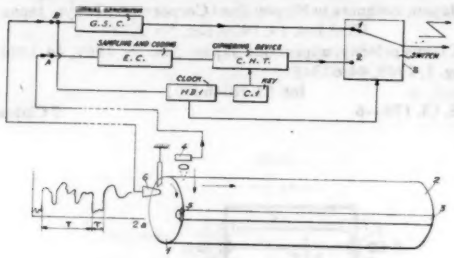
SECRECY FACSIMILE SYSTEM

Jean-Pierre Vasseur, Paris, France, assignor to CSF-Compagnie Generale de Telegraphie Sans Fil

Continuation of Ser. No. 552,194, May 23, 1966, abandoned. This application July 31, 1970, Ser. No. 60,159
Int. Cl. H04n 1/44
U.S. Cl. 178—5.1 5 Claims

A system for secret communication is intended for transmitting successive sequences of *n* information digits, each sequence being separated from the following one by predeter-

mined synchronization digits. The information digits are ciphered before the transmission, and the synchronization



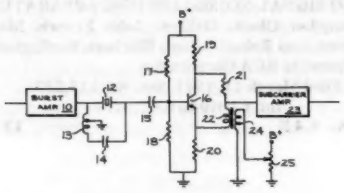
digits are transmitted in clear. The synchronization digits are used for synchronizing the ciphering at the transmission, and the deciphering at the reception.

3,715,479

TINT CONTROL CIRCUIT USING PHASE SPLITTER

R. John H. Brush, and George W. Singleback, both of Chesapeake, Va., assignors to General Electric Company

Filed April 9, 1971, Ser. No. 132,772
Int. Cl. H04n *9/44*
U.S. Cl. 178—5.4 HE **3 Claims**



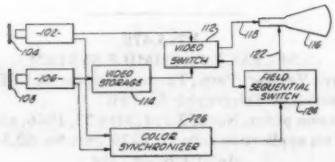
Opposed-phase 3.58 MHz subcarrier signals are applied to opposite ends of a circuit comprising the series combination of a resistor and a variable inductor. An output taken at the junction between the resistor and inductor produces a sinusoidal voltage whose magnitude remains substantially constant and whose phase may be varied by changing the value of the inductor. In a further embodiment a capacitor is connected in series with the inductor to afford a broader range of phase control.

3,715,480

MOTION DETECTION SYSTEM

Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,751
Int. Cl. H04h *7/02*
U.S. Cl. 178—6 **6 Claims**



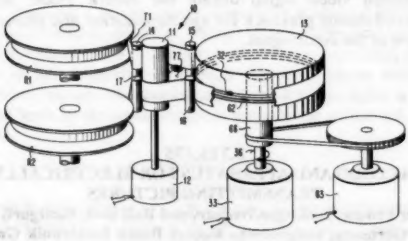
A method and system for detecting object motion. Light emanating from a scene is filtered by a first filter and second filter and recorded by a first recording device and a second recording device, respectively. The signals from one of the recording devices is delayed with respect to the other recording device and then both signals are reproduced. At least one of the reproduced signals is again filtered and then both reproduced signals are then superimposed and a color reproduction suitable for detection by the human eye is produced. The reproducing means may be in the form of a phosphor screen which changes color as current density is changed, with each of the signals being alternately applied to the reproducing means. Alternatively, the recording device and reproducing means could be motion picture cameras and projectors or television cameras and receivers.

3,715,481

MAGNETIC RECORDING AND REPRODUCTION APPARATUS FOR SINGLE PICTURE VIDEO WITH AUDIO

Jerome D. Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1967, Ser. No. 657,897
Int. Cl. G11b *5/50*
U.S. Cl. 178—6.6 FS **10 Claims**



An audio and visual recorder wherein the magnetic tape is helically wound about a drum which contains a video and an audio magnetic record and playback head for recording and playing back video and audio information obliquely disposed on tracks of the tape. The head scans a first path of the tape while the tape is being held stationary to provide one frame or two fields of video information. Subsequently the audio head scans the video tape selectively and at a much slower speed. In this way, a single picture can be repetitively obtained on a first track at a first speed by the video head and the audio is recorded at a much slower speed to correspond to the single picture on the video track. After the audio track has been completed to its desired length the recording tape is moved longitudinally to a second position for recording a second video track and a second audio track. The cycle then repeats itself so that a first video track is recorded at a relatively high speed and the audio track at a much slower speed is completed.

3,715,482

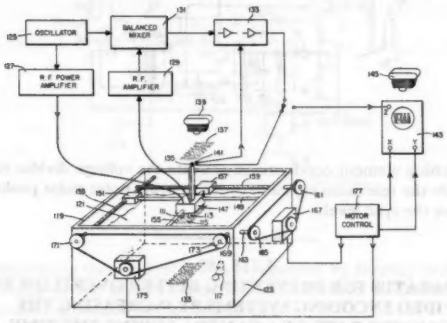
HOLOGRAPHIC IMAGING BY SIMULTANEOUS SOURCE AND RECEIVER SCANNING

Kenneth A. Haines, Christchurch, New Zealand, and Bernard P. Hildebrand, Richland, Wash.

Division of Ser. No. 744,732, July 15, 1968, Pat. No. 3,632,183. This application Oct. 12, 1971, Ser. No. 188,148
Int. Cl. H04n *1/24*
U.S. Cl. 178—6.7 R **5 Claims**

Both a radiation source and a radiation receiver are scanned relative to an object scene under investigation for obtaining holographic information as to the scene. By relating the relative movement of the source and receiver in a predetermined manner, various characteristics of the holographically reconstructed image of the object scene may be controlled. In one embodiment, the source and receiver are locked together and

scanned relative to an object scene during the construction of a hologram capable of reconstructing an image of the object scene with twice the resolution that is obtained by ordinary holographic techniques. Apparatus for carrying out this improved scanning technique is disclosed in the embodiment of ultrasonic holography wherein a hologram is constructed directly on photographic film or displayed on a cathode ray oscilloscope.

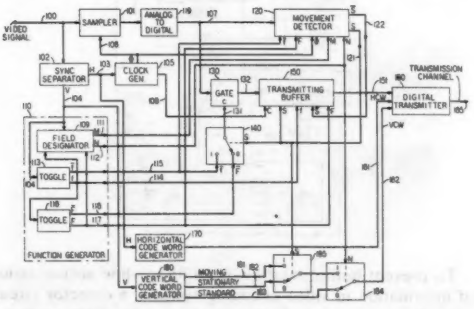


3,715,483

BANDWIDTH REDUCTION SYSTEM FOR USE WITH VIDEO SIGNALS

John Ormond Limb, New Shrewsbury, and Roger Fabian Wedgwood Pease, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 11, 1970, Ser. No. 97,079
Int. Cl. H04n *7/12*
U.S. Cl. 178—6.8 **12 Claims**



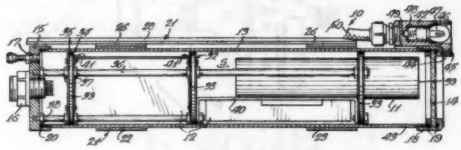
Changes in the amplitude values of the picture elements in every fourth field of an interlaced video signal are counted in order to determine whether or not movement has occurred in the picture. If movement has not occurred, alternate frames are transmitted to the receiving location. If movement has occurred, alternate fields are transmitted to the receiving location. In the receiver, when no movement is detected, the amplitude value for each picture element in the frames which have not been transmitted is reconstituted by temporally interpolating between the corresponding amplitude values for that picture element in the adjacent transmitted video frames. When movement is detected, the amplitude values for each picture element in the nontransmitted fields is established by temporally and spatially interpolating between the values for the picture elements taken from adjacent lines in the fields which precede and follow the nontransmitted picture element. To buffer the selected video information with a transmission system having a constant bit rate, the even picture elements are stored for transmission during the intervals when the frames and fields are blocked from being coupled through to the transmission channel.

3,715,484

DUCT SCANNING APPARATUS

Roy C. Latall, Des Plaines, Ill., assignor to Conco Inc.

Filed Feb. 11, 1971, Ser. No. 114,606
Int. Cl. H04n *5/26, 7/10*
U.S. Cl. 178—6.8 **9 Claims**



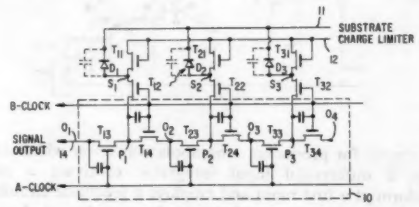
A duct scanning apparatus such as for use in determining leaks in a sewer pipe or the like wherein means are provided for progressively picturing the length of the inside of the duct. The picturing means may include a television vidicon pickup tube mounted within a tubular housing. The housing is preselected to be smaller in diameter than the inside of the sewer duct and means are provided for slidably carrying the housing on the duct wall so as to dispose the axis of the housing substantially below the axis of the duct. The apparatus further includes illuminating means carried on the housing for illuminating the portion of the interior of the sewer duct being pictured.

3,715,485

RADIATION SENSING AND SIGNAL TRANSFER CIRCUITS

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation

Filed Oct. 12, 1971, Ser. No. 188,183
Int. Cl. H04n *5/30*
U.S. Cl. 178—7.1 **12 Claims**



An array of radiation sensing elements such as photodiodes and a corresponding number of charge storage means, each associated with a different sensing element. A charge limiting circuit limits to a given level the maximum charge which may be accumulated by any storage means. The charge in a row of storage means may be transferred to an output register by concurrently: (a) disconnecting the limiting circuit from the row of storage means, (b) enabling a set of charge transfer gates between the row of storage means and the register, and (c) shifting the voltage levels at the row of storage means.

3,715,486

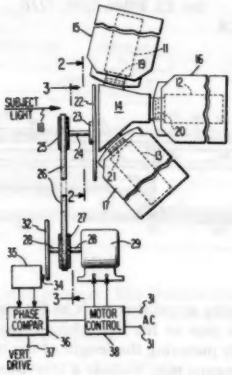
SHUTTERING APPARATUS FOR TELEVISION CAMERAS

Harry Gilbert Wright, Haddonfield, N.J., and Robert Adams Dischert, Burlington, N.J., assignors to RCA Corporation

Filed March 19, 1971, Ser. No. 126,081
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.2 **10 Claims**

The apparatus is a generally opaque disc mounted in the camera tube light path for rotation about an axis vertically displaced from the light path and having two like, diametrically

opposed and generally arcuate apertures with such configurations that different horizontal areas of the photosensitive target electrode of the tube are successively and equally exposed to light from a subject during each scanning field.

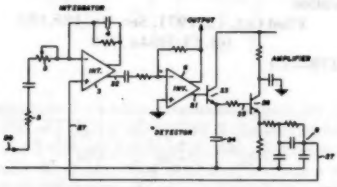


3,715,487

PARABOLA GENERATOR MOVING ERROR CORRECTOR

James E. Blake, Liverpool, N.Y., assignor to General Electric Company

Filed Oct. 29, 1971, Ser. No. 193,887
Int. Cl. H03b *1/00*
U.S. Cl. 178—7.3 R **7 Claims**



A circuit for producing a parabola waveform which comprises a differential input integrator receiving a ramp waveform at a first input and employs a feedback circuit including a peak detector connected to its second input. Any departure of the vertical rate parabola from steady-state conditions, caused by introducing a DC component into the first input, is thus detected in the form of an error voltage at the second input of the integrator, thereby cancelling out the DC component to prevent its having any effect on the output signal.

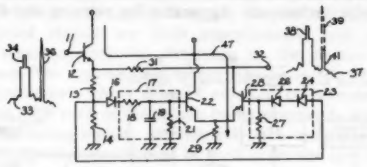
3,715,488

NOISE CANCELLATION CIRCUIT

Tadashi Takise, and Takashi Okada, both of Tokyo, Japan, assignors to Sony Corporation, Shinagawa-ku, Tokyo, Japan

Filed April 1, 1971, Ser. No. 130,084
Claims priority, application Japan, April 3, 1970, 45/28456
Int. Cl. H04n *5/04*, *5/44*
U.S. Cl. 178—7.3 S **8 Claims**

An amplifier circuit for stabilizing sync circuits and reducing noise voltage spikes that extend beyond sync signal level of a television signal. The television signal is applied through a rectifier and smoothing circuit to a differential amplifier, which includes a normally non-conductive switching element that forms part of a voltage divider for the television signal. The same signal, without rectification or smoothing, is also applied to the differential amplifier. Noise voltage peaks exceeding sync peaks cause the differential amplifier to make the switching element conduct and activate the voltage divider to divide the television signal in order to bring noise pulse peaks below the sync level.

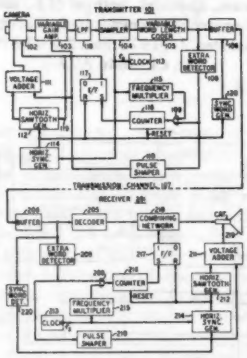


3,715,489

APPARATUS FOR PREVENTING BUFFER OVERFLOW IN VIDEO ENCODING SYSTEMS BY INCREASING THE SCANNING RATE OF A CAMERA DURING THE TIME INTERVAL OF THE ENCODING OF DIGITAL WORDS OF EXTRA LENGTH

Earl Franklin Brown, Piscataway, and William Kaminski, West Portal, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 23, 1971, Ser. No. 118,145
Int. Cl. H04n *7/12*
U.S. Cl. 178—7.1 **8 Claims**



To prevent buffer overflow from line-to-line accumulation of information in video encoding systems, a detector circuit notes the occurrence of extra words or extra digits produced by a variable word length encoder. In response to this detection, a voltage adding means incrementally alters the slope of the horizontal sweep sawtooth which, in turn, results in a temporary increase in camera scanning speed. Logic means insures that the time obtained from the active scanning region by increasing scanning speed is allocated to the blanking interval.

3,715,490

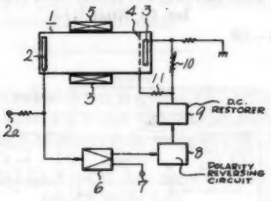
CAMERA TUBE RESIDUAL IMAGE ELIMINATION APPARATUS

Takashi Okada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 25, 1970, Ser. No. 39,999
Claims priority, application Japan, May 31, 1969, 44/42808
Int. Cl. H04n *5/34*
U.S. Cl. 178—7.2 **12 Claims**

In color video signal generating apparatus which includes a video camera tube such as a Vidicon tube, the output signal often includes a residual image component. The residual

image component appears in the picture as a ghost of the previous frame or frames. This invention provides a system for diminishing the residual image component by feeding back a portion of the output signal from the camera to the beam generating portion of the camera tube.



3,715,491

TELEVISION CAMERA TUBE COOLING ARRANGEMENTS

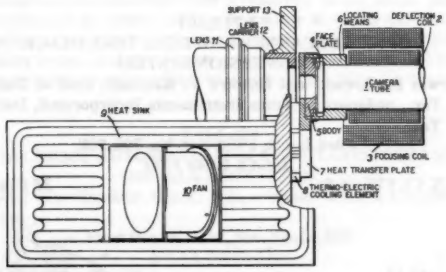
Derek James Finch, Essex, England, assignor to The Marconi Company Limited, London, England

Filed March 8, 1971, Ser. No. 121,767

Claims priority, application Great Britain, March 14, 1970, 12,396/70

Int. Cl. H04n 5/26

U.S. Cl. 178—7.2 **8 Claims**



A camera tube cooling arrangement has a body of good thermal conductivity and low dielectric constant mounted in good thermal contact with the face plate of the camera tube and outside the image area of the camera tube. The body is cooled by a thermo-electric cooling unit which is mounted with its cold face in thermal contact with the body and its hot face in thermal contact with a finned heat sink.

3,715,492

HIGH VOLTAGE PROTECTION CIRCUIT

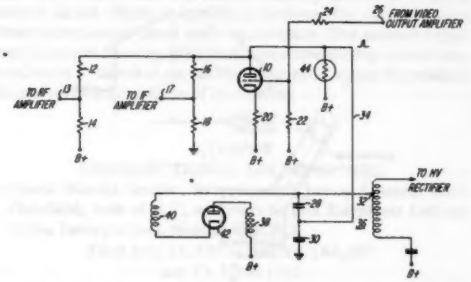
William Vincent Fitzgerald, Jr., Indianapolis, Ind., assignor to RCA Corporation

Filed May 18, 9171, Ser. No. 144,458

Int. Cl. H04n 5/68

U.S. Cl. 178—7.3 R **5 Claims**

A voltage dependent resistor is cooperatively coupled with a keyed automatic gain control device to provide control signals sufficient to bias off the radio and intermediate frequency amplifier stages of a television receiver when the amplitude of the keying pulse reflects an open-circuiting of a horizontal retrace capacitor which raises the developed high voltage to an excessive level.



3,715,493

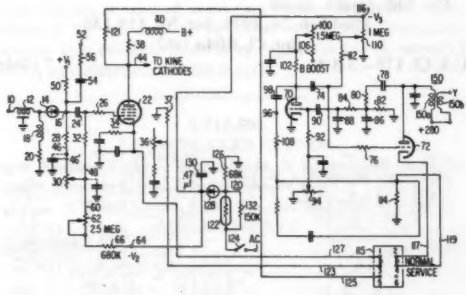
SERVICE SWITCH ARRANGEMENT FOR IMPROVED INTERLACE PERFORMANCE

John Kenneth Allen, Indianapolis, Ind., assignor to RCA Corporation

Filed Oct. 12, 1971, Ser. No. 187,987

Int. Cl. H04n 5/44, 9/12

U.S. Cl. 178—7.3 R **4 Claims**



A set-up switch, employed in making gray scale adjustments during the manufacture and servicing of a television receiver, is constructed to disable the receiver's vertical deflection by opening the cathode circuit of the vertical output tube. By connecting into a relatively low impedance cathode circuit, any tendency for the switch network to pick up and couple horizontal pulse voltages into the vertical circuitry will be minimized, and interlace performance will be optimized. This will be so though the leads from the vertical output tube to the service switch on the television chassis are of the order of 24 inches, and longer.

3,715,494

PROJECTION SYSTEM

Edward F. Perlowski, Jr., Baldwinsville, N.Y., assignor to General Electric Company

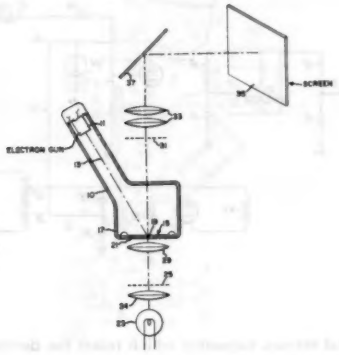
Filed Jan. 28, 1971, Ser. No. 110,519

Int. Cl. G02b 5/22; H04n 5/72

U.S. Cl. 178—7.5 D **6 Claims**

An improved electronic image projection system having a container with a conducting interior and a deformable medi-

um in the container which decreases in resistivity with decreases in thickness in the presence of electrical charge on



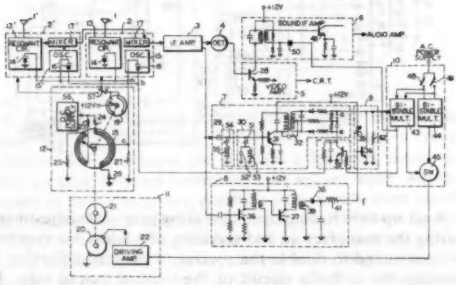
the surface of the medium is provided by using as the deformable medium a polymeric material having as an additive a 9,10-anthracene derivative.

3,715,495

SIGNAL SEEKING TYPE AUTO-TUNING TELEVISION RECEIVER

Tsuneo Takezaki, Neyagawa, and Sukeichi Miki, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 26, 1971, Ser. No. 119,136
Int. Cl. H04n *5/62*
U.S. Cl. 178—5.8 A **7 Claims**



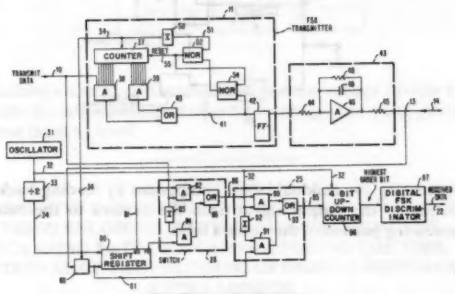
A signal seeking type auto-tuning television receiver including a tuning means which has a reversely biased voltage variable capacitance diode, a main detecting means which comprises a limiter with a filtering circuit and a frequency discriminator for detecting sound IF carrier signals and developing a main control signal, a subsidiary detecting means which comprises a tuned amplifier, a transistor detector and a rectifier for detecting picture IF carrier signals and developing a subsidiary control signal, and a scanning means coupled to the tuning means to supply a sweep voltage to the voltage variable capacitance diode and controlled by the main and subsidiary control signals so as to stop when a desired television signal is received and so as not to stop when undesired noises are detected.

3,715,496

DIGITAL BAND-PASS FILTER FOR A SINGLE CIRCUIT FULL DUPLEX TRANSMISSION SYSTEM

Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,295
Int. Cl. H04l *5/14*
U.S. Cl. 178—58 **4 Claims**



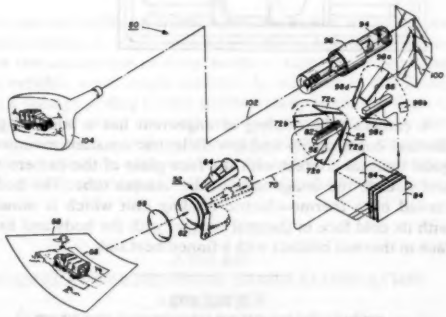
A full duplex data communications system using a single transmission circuit is shown. Each terminal of the system has its receiver circuit provided with a digital filter to remove from its input circuit, the frequencies being used for data transmission at that terminal. The digital filter is switchable by the data signal to be transmitted and will be set to block from the receiver, the particular frequencies then being used to transmit data. In the preferred embodiment, the signal on the transmission line is converted to a delta modulated signal which is combined with its prior signal delayed by an interval dependent upon the data being transmitted from that terminal to generate a delta modulated filtered signal carrying the received data. The filtered signal is then converted to recover the received data.

3,715,497

OPTICAL SCANNER AND REAL TIME IMAGE CONVERSION SYSTEM

Erwin E. Cooper, and Howard V. Kennedy, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 2, 1969, Ser. No. 790,508
Int. Cl. H04n *3/00*
U.S. Cl. 178—6.8 **35 Claims**



A system for converting infrared radiation in the 8–14 micron region to a real time visual image is disclosed. A lens system focuses the image at an image plane. A plurality of mirrors are disposed between the lens system and the image plane and are rotated about an axis intersecting the optical axis at the entrance pupil. Each mirror is disposed to focus an arcuate segment of the image onto a linear array of detectors located substantially on the axis of rotation as the mirror moves

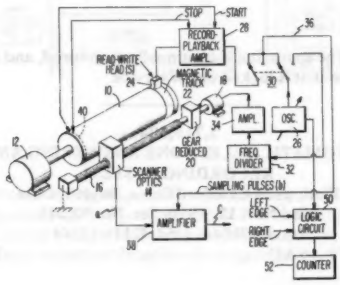
through the optical field of view. The image thus scanned is reconstituted at the target of a vidicon type television camera by the same type of system having mirrors rotated in synchronism with the scanning mirrors, but utilizing light emitters rather than light detectors. The video signal from the television camera is then displayed on a conventional television display tube for visual observation.

3,715,498

SCANNING SYSTEM WHICH INCLUDES MEANS FOR CONTROLLING PICTURE SAMPLING DENSITY

Harold E. Haynes, Cranbury, N.J., assignor to RCA Corporation

Filed Sept. 7, 1971, Ser. No. 178,330
Int. Cl. H04n *1/04*
U.S. Cl. 178—69.5 F **3 Claims**



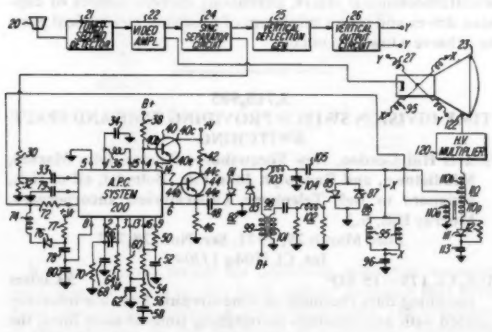
Clock signals are recorded on an erasable track, such as a magnetic track, on the surface of a facsimile-type drum. These signals are read from the drum during the optical scanning process and employed to sample the electrical signal produced by the optical scanner. Any desired sampling density in the circumferential direction, over a relatively broad range, may be achieved by control of the frequency at which the clock signals are recorded on the erasable track. The same sampling density in the axial direction may be obtained by control of the speed, in the direction of the drum axis, of the optical scanner.

3,715,499

DUAL MODE AUTOMATIC FREQUENCY CONTROLLED OSCILLATOR SYSTEM

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation

Filed Dec. 3, 1970, Ser. No. 94,889
Int. Cl. H04n *5/04*
U.S. Cl. 178—69.5 TV **13 Claims**



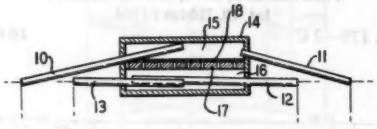
A dual mode automatic phase controlled oscillator system employs multiple keyed phase comparators to produce control signals which are applied to lock the oscillator frequency and phase to a reference signal. One of the keyed comparators is continuously employed to produce an in-sync control signal. A coincidence gate is utilized to detect the existence of out-of-sync conditions, and associated circuitry produces a mode control signal which is applied to activate the second keyed phase comparator upon such occurrence. The second keyed comparator is thereby selectively operative during out-of-sync conditions to develop an additional control signal to enhance the pull-in characteristics of the system.

3,715,500

UNIDIRECTIONAL MICROPHONES

Gerhard Martin Sessler, Summit, and James Edward West, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 21, 1971, Ser. No. 164,507
Int. Cl. H04r *1/32*
U.S. Cl. 179—1 DM **10 Claims**



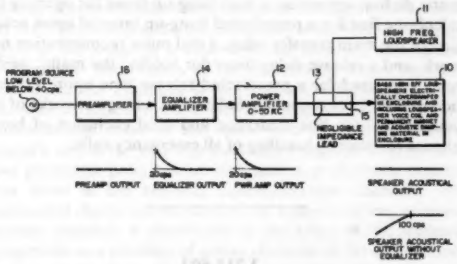
A second-order unidirectional microphone is constructed with two pairs of acoustic tubes arranged to sample a sound field at four different points on a straight line. Acoustic signals from two diametrically opposed tubes, one short and one long, are summed in a first cavity and signals from two other opposed tubes, one short and one long, are summed in another cavity. Signals developed in the two cavities are differentially combined by an electret or other transducer interposed between the cavities. Necessary signal delay is provided directly by differences in tube lengths.

3,715,501

LOUDSPEAKER SYSTEM

Roger Howard Russell, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,264
Int. Cl. H04r *3/12*
U.S. Cl. 179—1 D **2 Claims**



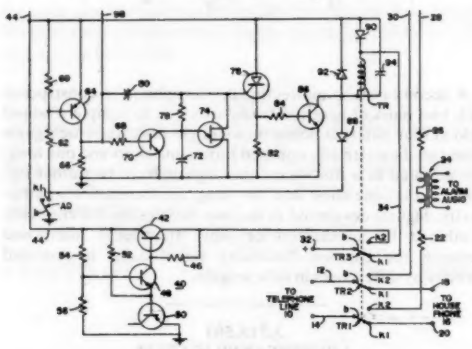
A flat acoustic pressure response, compensating network, driver amplifier and loudspeaker system, the driver amplifier being an effective voltage source and the loudspeaker system containing multiple speakers including a low frequency loudspeaker mechanism which is both efficient and highly damped magnetically by providing a powerful magnetic flux field, and a many turn motor coil which is capable of enforcing wide cone excursions. The loudspeaker mechanism in the enclosure without acoustic damping has a higher Q than the same mechanism in the same enclosure with acoustic damping

added. Response gradually rolls off below 150 Hz and down to system resonance approaching a rate of 6 dB per octave. Below system resonance rolloff gradually approaches 12 dB per octave. Rolloff prior to system resonance occurs due to a high flux density, long motor turns, low resistance, and low moving mass producing a Q at system resonance of 0.5 or less. The speaker is operated at high efficiency above 150 Hz and its rolloff is compensated to about 20 Hz by a compensation equalizer. This equalizer is connected to the input of the driving power amplifier and involves about 20 dB of boost at 20 Hz.

3,715,502
ALARM COUPLER

Stephen J. Martin, Miami, Fla., assignor to Robertshaw Controls Company, Richmond, Va.

Filed March 3, 1971, Ser. No. 120,416
Int. Cl. H04m *1/04*
U.S. Cl. 179—2 C **16 Claims**



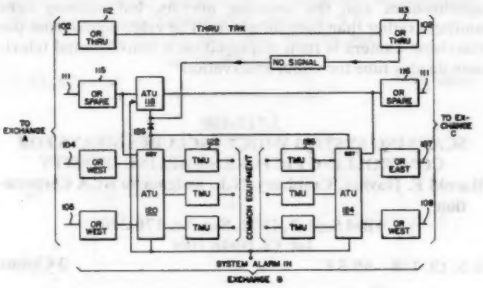
A solid-state coupler for transferring a telephone line from conventional house phones to automatic dialing apparatus upon the occurrence of an alarm includes a main transfer relay, a dialing relay adapted to be controlled by the automatic dialing apparatus, a start hang-up timer for opening the telephone line for a preselected hang-up interval upon actuation of the main transfer relay, a dial pulse reconstitution network, and a release delay timer for holding the main transfer relay energized for a preselected release time upon termination of the alarm sequence. Solid-state timing networks of the coupler provide line clearance and total exclusion of house phones for priority handling of all emergency calls.

3,715,503
AUTOMATIC TRANSFER ARRANGEMENT FOR TELEPHONE SYSTEM

Ernest J. Jungbluth, Penfield, N.Y.; Paul K. Kavanaugh, Webster, N.Y., and Frederick H. Gardner, Penfield, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,310
Int. Cl. H04j *3/14*
U.S. Cl. 179—15 BF **3 Claims**

Logic circuitry for automatically substituting a spare trunk line in place of a normal one in response to an alarm signal generated at one or both of the central offices connected by

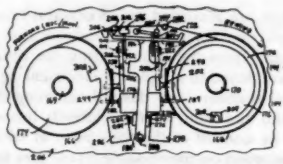


the lines. The spare line is continually monitored, and if a fault develops on it, it is locked out of service.

3,715,504
AUTOMATIC TELEPHONE ANSWERING AND RECORDING SYSTEM

Chester J. Piott, 6824 Cranford Drive, Dayton, Ohio

Filed Nov. 17, 1970, Ser. No. 90,241
Int. Cl. H04m *1/64*; G11b *15/44*
U.S. Cl. 179—6 AC **7 Claims**



An automatic telephone answering and recording system having a passive circuit for detecting the ringing of a telephone annunciator bell. The signal generated in the circuit is of a sufficient level to cause a passive electronic switching element to become conductive which in turn permits energization of the system. Moreover, the system outgoing message tape is used to actuate a tape rewind mechanism, as well as to control the timing sequence for recording the message on the incoming message tape. The system does not use solonoids, electromechanical relays, alternating current motors or capstan drives and uses a minimum of precision mechanical parts to achieve a low system cost.

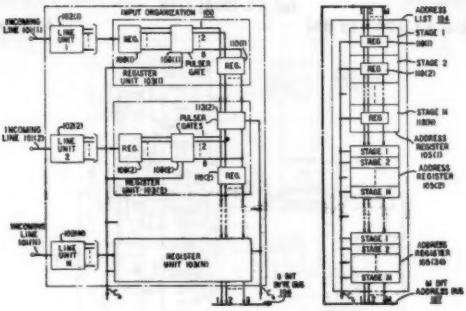
3,715,505
TIME-DIVISION SWITCH PROVIDING TIME AND SPACE SWITCHING

Travis Hill Gordon, New Shrewsbury; Patrick John Marino, Middletown, and Randolph John Pilc, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 29, 1971, Ser. No. 128,767
Int. Cl. H04q *1/04*
U.S. Cl. 179—15 AQ **5 Claims**

Incoming data channels on time-division lines are interconnected with any channels on outgoing time-division lines, the lines accommodating serial multibit bytes during individual time slots. All incoming bytes from the several lines are applied to a common data bus to create a superframe, the data

bus having a plurality of parallel leads to carry the bits of the byte. Address data, applied to a common address bus by a processor, steers each byte from the data bus to a selected one

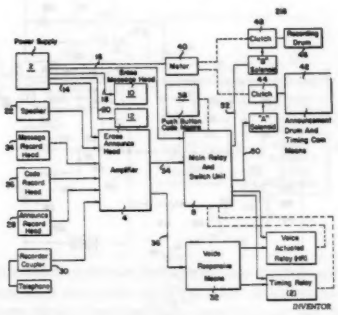


of a plurality of registers, each register being dedicated to an outgoing channel. Each outgoing line then sequentially reads out the stored data from the registers dedicated to the outgoing channels accommodated by the outgoing line.

3,715,506
REMOTE CALL BACK TELEPHONE ANSWERING APPARATUS

Herman Haag, Dachau Munich, and Willy Muller, Zollikon/Schweiz, Switzerland, assignors to said Muller, by said Haag

Filed May 23, 1968, Ser. No. 731,490
Int. Cl. H04m *1/64*; G11b *19/02*
U.S. Cl. 179—6 E **7 Claims**

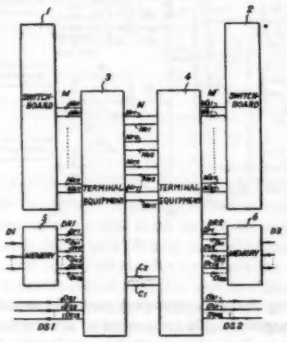


Remote control means for operating telephone message recording apparatus to play back callers' messages that have been previously recorded on a recording drum. The invention is characterized by the provision of voice-code responsive means for activating the playback means only when a given oral sound is presented at predetermined code-responsive timing intervals.

3,715,507
BILATERAL START-STOP TRANSMISSION SYSTEM FOR DIGITAL INFORMATION

Shintaro Oshima, Tokyo; Yukio Nakagome, Yokohama, and Yasuo Fukata, Tokyo, all, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Continuation-in-part of Ser. No. 818,762, April 23, 1969, abandoned. This application May 26, 1972, Ser. No. 257,444
Claims priority, application Japan, July 22, 1968, 43/051372
Int. Cl. H04j *5/00*
U.S. Cl. 179—15 BY **1 Claim**



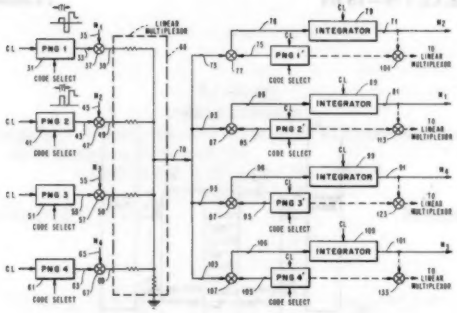
A transmission system for bilaterally transmitting digital information of a first group of two-way communication channels to a second group of two-way communication channels, respectively, corresponding to the first group of two-way communication channels by the use of a pair of terminal equipments and a plurality of two-way start-stop telegraph lines therebetween, the number N of which is at least equal to the number *n* of the two-way communication channels in each group. The digital information of a plurality of first one-way communication channels is temporarily stored at a memory device and then transmitted, after determination of active one-way communication channels to be connected to the two-way start-stop telegraph lines, from one of the terminal equipments to the other in a characterwise manner, so that the stored digital information of the determined active one-way communication channels is successively allocating to idle character periods of the two-way start-stop telegraph lines in a predetermined order of the active one-way communication channels and of the two-way start-stop telegraph lines so as to have particular polarities of start and stop elements distinct from those of the two-way communication channels. The transmitted digital information of the active one-way communication channels is distributed at the other of the terminal equipments to a plurality of active channels of the second one-way communication channels corresponding respectively to the first one-way communication channels by the use of control information indicative of the determined active first one-way communication channels and transmitted from one of the terminal equipment. The digital information of a plurality of third one-way communication channels is similarly transmitted from the other to the one of the terminal equipments to distribute to a plurality of fourth one-way communication channels.

This invention relates to a transmission system for transmitting digital information of a plurality of bilateral channels through a plurality of start-stop telegraph lines.

3,715,508
SWITCHING CIRCUITS EMPLOYING ORTHOGONAL AND QUASI-ORTHOGONAL PSEUDO-RANDOM CODE SEQUENCES

Herman L. Blasbalg, Baltimore, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 15, 1967, Ser. No. 667,972
Int. Cl. H04m 3/00
U.S. Cl. 179—15 BC 16 Claims

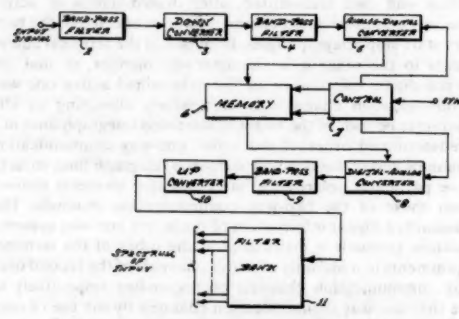


Switching circuits employing pseudo-random orthogonal or quasi-orthogonal code sequences to accomplish line to line or line group to line group switching in both a linear and non-linear mode.

3,715,509
METHOD AND MEANS FOR PROVIDING RESOLUTION LEVEL SELECTION IN A SPECTRUM ANALYZER

Edward C. Dawson, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Feb. 18, 1971, Ser. No. 116,337
Int. Cl. H04b 1/66
U.S. Cl. 179—15.55 T 1 Claim

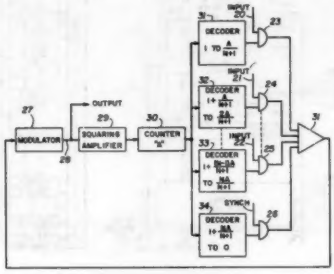


Resolution level selection in a spectrum analyzer is provided by digitizing the IF analog input signal at a controllable rate, storing it in a digital memory device, and reading out the stored digital signal at an increased rate into a digital-to-analog converter. The resolution level is determined by the relationship between the digitizing rate and the memory read out rate.

3,715,510
METHOD AND APPARATUS FOR HANDLING DATA FROM A PLURALITY OF CHANNELS

Burton H. Birnbaum, Floral Park, and Daniel J. Spier, Little Neck, both of N.Y., assignors to Computer Instruments Corporation, Hempstead, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,607
Int. Cl. H04j 3/16
U.S. Cl. 179—15 BM 6 Claims

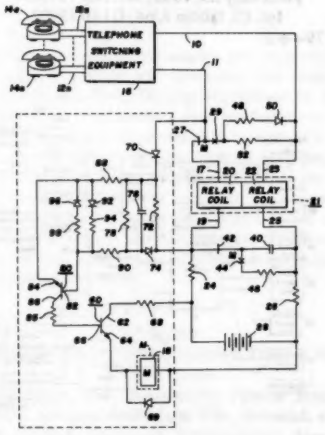


A time-multiplexing system wherein a frequency-modulated signal contains the data from a plurality of channels in time-sequential order. Each channel is represented by the same integral number of periods of a sample of the signal therein. Upon reception of this signal, it is converted back to individual channels of data by controlled integration of a constant signal in accordance with the duration of the period of the signals in each sample.

3,715,511
TELEPHONE PULSING CIRCUIT

William E. Shaffer, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,646
Int. Cl. H04g 1/36
U.S. Cl. 179—16 E 12 Claims

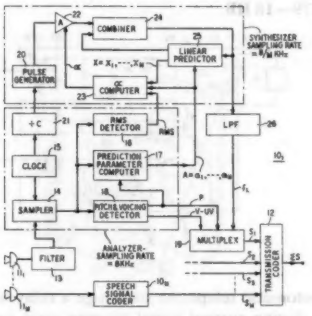


An inductive control device, such as a relay, is connected in series with a direct current power source, across a pair of conductors adapted to be connected to a telephone line to function as a pulsing circuit. A control circuit monitors the current flow in the series circuit and actuates a switching circuit when the telephone loop is open circuited to momentarily disconnect the pulsing circuit from the conductors and connect a resistive circuit across the conductors.

3,715,512
ADAPTIVE PREDICTIVE SPEECH SIGNAL CODING SYSTEM

James Michael Kelly, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1971, Ser. No. 209,655
Int. Cl. G10l *1/06*
U.S. Cl. 179—1 SA 8 Claims

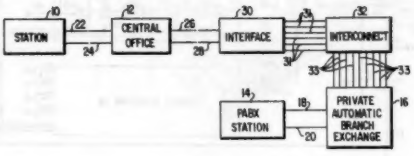


In an adaptive, predictive coder for speech signals, the transmitted signal generally consists of an rms value, a pitch signal, a voice-unvoiced indication, and a number of parameter signals for adjusting the coefficients of a linear predictor. Transmission of these signals is improved in this invention by generating a low rate pulsive signal and by shaping its spectrum in accordance with the parameter signals. The pulsive signals thus act as a carrier for the parameters. The bandwidth required for transmitting the resulting composite signal, i.e., the modulated pulsive signal and the subsidiary signals, is substantially less than that of the original speech signal and somewhat less than that required for the transmission of predictively coded signals.

3,715,513
PABX-INTERFACE INTERCONNECTION DEVICE

Louis A. Miller, Utica, N.Y., assignor to DND Electronics, Utica, N.Y.

Filed Oct. 29, 1970, Ser. No. 85,036
Int. Cl. H04m *7/06*
U.S. Cl. 179—18 AD 8 Claims

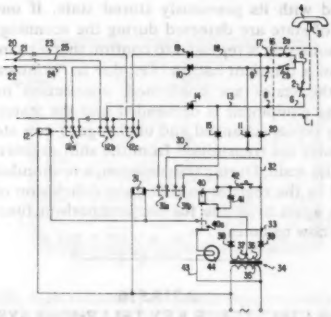


An interconnection device for telephonic circuits automatically restores to a two-wire configuration telephonic signals applied to a multiple wire telephone interface circuit. Supervision, polarity, and/or alert signals distributed by an interface in the form of multiple circuit closures are reproduced in the form of two-wire signals made available to customer-owned equipment. The interconnect device permits duplex services between the premises of the customer user and outside locations reached through the central office. A plug-in printed card construction of the interconnect offers extremely convenient access to customer-owned equipment and provides numerous interconnect options with efficient mounting thereof.

3,715,514
TELEPHONE SECURITY DEVICE

Allan D. Bell, Jr., Annandale, Va., assignor to Dektor Counterintelligence and Security, Annandale, Va.

Filed Oct. 7, 1970, Ser. No. 78,765
Int. Cl. H04m *1/00*
U.S. Cl. 179—81 E 4 Claims

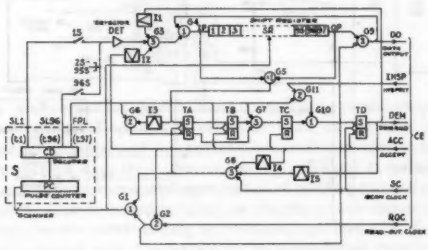


A device for preventing use of an on-hook telephone for eavesdropping or "bugging." A voltage source is connected to the telephone line selector and hook switch through a diode matrix and sensing relay coil. When the telephone is "on-hook" (hook switch open) all conductors from the telephone instrument are short circuited together and are disconnected from the telephone conductors leading out of a private or secure area in which the telephone is located. The short circuiting is accomplished by a plurality of relays responsive to the condition of the sensing relay. When the instrument is off-hook the telephone conductors leading from the instrument are connected to the conductors leading from the area for normal conversational use. A lamp and photoresistor device is provided to isolate the annunciator from external conductors.

3,715,515
SHIFT-REGISTER RE-ENTRY SCANNER WITH CONFIRMATION SCAN FOR DETECTED DISPARITY

Harold James Stirling, Reading; Roger Morley Williams, Maidenhead; Peter Samuel Hampson, Leigh, and James Kenneth Price, Wollaton, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed May 25, 1971, Ser. No. 146,687
Claims priority, application Great Britain, May 27, 1970, 25,580/70
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FF 3 Claims



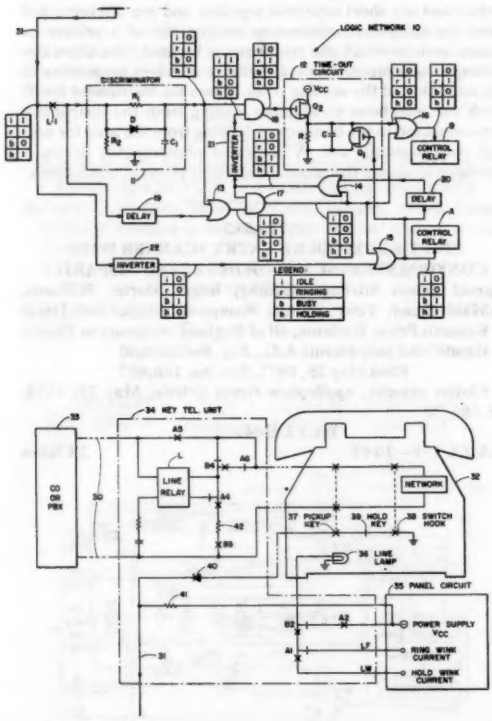
In automatic telephone exchanges of the stored-program-controlled type it is necessary for information randomly initiated at telephone peripherals (subs. line circuits, markers, junction relay sets etc) to be communicated to the central data processing equipment. The peripherals may be single or multiple signal-initiating points (e.g., relay "make" contacts

which may randomly change their states). The proposal enables a single form of circuit to be used for say 96 signal-initiating points relevant to single or multiple-point peripherals or combinations thereof. The circuit comprises a shift register SR for storing the state of each signalling of the block and means S for scanning the signalling points to determine their states. The shift register and scanner are so co-ordinated as to enable the state of each point, at the time which it is scanned, to be compared with its previously stored state. If one or more changes of state are detected during the scanning cycle, the comparison cycle is repeated to confirm that a change-of-state was not of a transient nature (i.e., due to "contact-bounce") and, if the states are confirmed, connection to the data processing equipment is demanded and the states of all the signalling points (changed and unchanged) now stored in the shift register are transmitted from the shift-register as a high-speed pulse train. During transmission, a re-circulation path is provided by the register so that upon conclusion of transmission it is again available for the comparison function when scanning now resumes.

3,715,516
LINE CIRCUIT FOR KEY TELEPHONE SYSTEM

Jalal Ebrahimi, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Quebec, Canada

Filed June 17, 1971, Ser. No. 154,004
Int. Cl. H04q *1/30*
U.S. Cl. 179—18 FA **2 Claims**

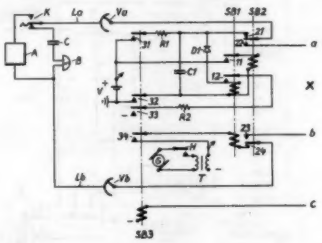


A line circuit for interfacing subscriber sets of a key telephone system with a telephone line terminating at its other end in a central office or a private branch exchange. The line circuit embodies a novel approach in this particular field, utilizing logic building blocks to condition two control means performing functions associated with such systems. The approach is well suited to MIS components and technologies.

3,715,517
TRIPPING ARRANGEMENT FOR RINGING CURRENT SIGNALS IN TELEPHONE EXCHANGES

Curt Ove Bille Sandberg, Tyreso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed March 8, 1971, Ser. No. 121,922
Claims priority, application Sweden, March 19, 1970, 3787/70
Int. Cl. H04m *3/02*
U.S. Cl. 179—18 HB **2 Claims**

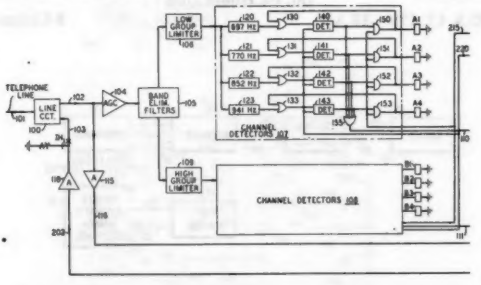


In an automatic telephone exchange a relay means is provided for ringing current signal tripping upon calls to a subscriber's instrument. The volume and cost for such a relay means are reduced with the help of a current-direction-dependent supervisory relay and a capacitance means connected in parallel and with a direct current source and a resistance means charging said capacitance means to a voltage of such a magnitude and polarity that the supervisory relay receives a direct-current voltage in backward direction during the ringing signals.

3,715,518
INTERRUPT NETWORK TO PROTECT A VOICE FREQUENCY SIGNAL DETECTOR FROM BEING TALKED-OFF BY OUTGOING SPEECH SIGNALS

Robert Riddle Campbell, Holmdel; George Herbert Honnold, Middletown, and Michael Lefkowitz, Old Bridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1971, Ser. No. 205,805
Int. Cl. H04m *1/50*
U.S. Cl. 179—84 VF **8 Claims**



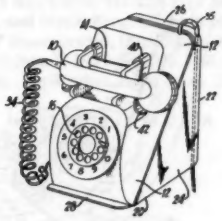
A station set which includes a two-way voice channel interconnects a telephone line and a voice recorder. The station set receiver detects incoming voice-frequency tone signals an, in response thereto, instructs the recorder to record, play back, select desired records, stop, et cetera. The playback signals may also contain the tone signals and the receiver is protected from being talked-off by the reflection of these outgoing signals. The protection involves momentarily interrupting the outgoing transmission when the tone signals are detected and enabling the station set to provide instructions to the recorder only in the event that detection of the tone signals continues during the interrupt interval. The duration of the interrupt interval is short so that the playback interruption is not objectionable and may not even be noticed by a listener.

3,715,519

DEVICE FOR CONVERTING TABLE TELEPHONE TO WALL TELEPHONE

Timothy J. O'Leary, Houston, Tex., assignor to The Raymond Lee Organization, Inc. New York, N.Y.

Filed June 24, 1971, Ser. No. 156,384
Int. Cl. H04m 1/11
U.S. Cl. 179—100 C 2 Claims



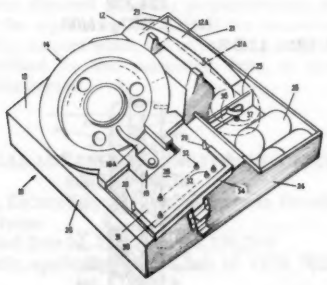
A device for converting a table telephone to a wall telephone wherein: the handset is held in normal cradle position even when the base is tilted forward; the handset can be easily removed from the cradle at all times; the telephone can be readily reconverted for table use; the dial face is held essentially vertical; and space is provided for storage of miscellaneous small items.

3,715,520

TELEPHONE DIALING APPARATUS

Nicholas S. Lambrou, 35 Devereaux Street, Arlington, Mass.

Filed Dec. 1, 1971, Ser. No. 203,569
Int. Cl. H04m 1/45
U.S. Cl. 179—90 A 20 Claims



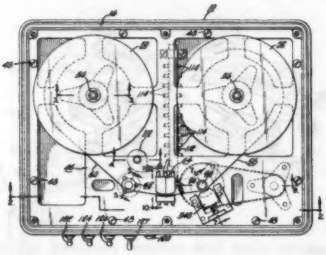
An accessory for a telephone to assist in the dialing of the digits of the telephone dial includes a housing that partially covers the telephone and has an opening therein through which the dial may be observed, an array of lights preferably disposed in a semi-circle about the dial with one light associated with each digit of the dial, and a stepping switch responsive to each dialing of the dial for stepping the stepping switch. The apparatus employs a code card having two sets of connectors that are interconnected in a predetermined pattern to identify an entire telephone number. This code card is coupled between the stepping switch and the light array and is adapted to control the successive illumination of the lights in a sequence corresponding to the telephone number and with one light being illuminated at a time associated with one digit which digit is the next one to be dialed.

3,715,521

RECORDER APPARATUS USING FLUID SUPPORT

John H. Licht, Middletown, N.J., assignor to AMBAC Industries, Incorporated, Philadelphia, Pa.

Continuation of Ser. No. 818,880, April 24, 1969, abandoned.
This application Aug. 24, 1971, Ser. No. 174,566
Int. Cl. G11b 5/60, 21/20
U.S. Cl. 179—100.2 P 6 Claims



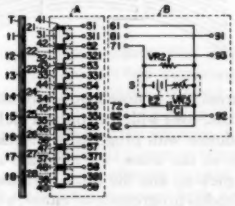
A long-life, high-reliability magnetic tape recorder in which the relatively-moving parts of the system are separated from each other by fluid films. The recorder components are immersed in a fluid contained in a sealed housing which serves as a fluid supply reservoir. A pump in the housing pumps the fluid to fluid-film devices for rotatably supporting a pair of tape reels and a capstan drive system, and for urging the tape against the capstan drive member. The pump also supplies fluid under pressure to a tape guide and to a magnetic head in such manner as to hold the moving tape out of contact with the guide and with the head; it also supplies pressurized fluid to its own fluid-film device to support its own moving parts. The fluid-film structure for the magnetic head provides a fixed spacing of the moving tape from the head for both high and low tape speeds and despite substantial changes in fluid viscosity.

3,715,522

MULTI-TRACK MAGNETIC HALL HEAD

Tsunehiro Tsukagoshi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed July 29, 1970, Ser. No. 59,219
Claims priority, application Japan, July 29, 1969, 44/59478
Int. Cl. G11b 5/38
U.S. Cl. 179—100.2 CH 7 Claims



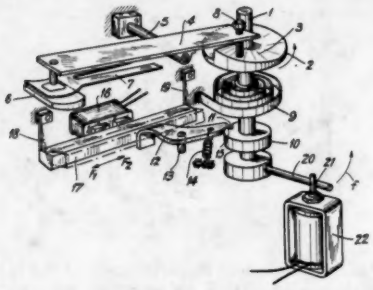
A multi-track magnetic head comprising a plurality of three-terminal T-type Hall elements each having one Hall potential terminal and two current terminals provided at both ends thereof, said Hall elements being arranged at positions aligned with a corresponding number of tracks provided on a magnetic tape to be reproduced, an electric power source supplying electric currents only to a selected number of Hall elements aligned with the tracks to be reproduced simultaneously, a common terminal provided on a balancing resistor connected across the power source, and a capacitor for adjusting the impedance of the power source so that the ratio between the impedance of each Hall element to the impedance of the power source is selected to be more than 100 in general cases and to be more than 10 when a stereophonic reproduction is undertaken.

3,715,523

POSITIONING MECHANISM FOR MAGNETIC HEAD

Hubert Cecyl Albert Rousseau, and Lucien Robert Prieur, Paris, France, assignors to Societe Industrielle Honeywell Bull (Societe Anonyme), Paris, France

Filed June 25, 1971, Ser. No. 156,633
Claims priority, application France, July 2, 1970, 7024574
Int. Cl. G11b 5/54
U.S. Cl. 179—100.2 CA 8 Claims



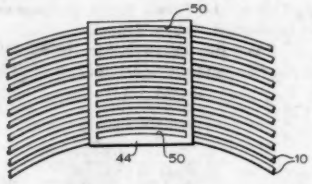
A device for controlling the positioning of heads for magnetic discs between non-operative retracted positions and operating positions proximate a surface of the disc wherein a simple compact mechanism selectively moves and locks the heads in their operating position when they reach a reference position opposite the disc or continues the heads in their retracted position for maintenance purposes.

3,715,524

ELECTRO-OPTICAL GROOVE TRACKING APPARATUS FOR VIDEO REPRODUCING SYSTEM

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed April 20, 1972, Ser. No. 246,048
Int. Cl. G11b 7/14, 7/18, 7/24
U.S. Cl. 179—100.3 V 5 Claims



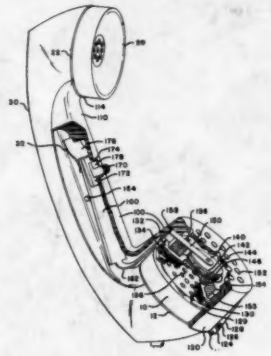
Video information is stored optically along a helical track on a rotating disc over which an optical pick-up moves radially in correspondence with progressive displacement of a monitored portion of the track. To maintain constant alignment between the pick-up and the track regardless of deviations in the intended radial progression of either, a control signal is applied to an electromechanical transducer in order to vary the position of the pick-up transversely relative to the monitored track portion. Spaced parallel from the disc is a mask to span a plurality of track segments. All of the slits are oriented generally along those segments, and the number of slits is slightly different from the number of the segments in the width of the span. A generally collimated beam of light is projected through the slits and the portion of the disc which carries the segment. A balanced photodetector system responds to a moire' pattern in the light which is projected through both the slits and the disc portion in order to develop a pair of signals which represent relative departure of the pick-up laterally from the monitored track length. A differential amplifier combines these signals into a control signal which is applied to the transducer to effect a compensatory variation in the position of the pick-up.

3,715,525

TELEPHONE HANDSET SHUTTER ATTACHMENT

Gordon Wilder Fielding, 11 Bruce Circle, Randolph, Mass.

Filed Aug. 12, 1971, Ser. No. 171,274
Int. Cl. H04r 1/08
U.S. Cl. 179—187 11 Claims



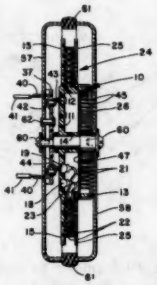
The shutter attachment disclosed clips over the mouthpiece and handle of a standard telephone handset and provides means by which pressing a button on the handle portion of the attachment, a valve closes against a valve plate, shutting off the telephone transmitter to ambient noise. Alternative embodiments are shown for lever operation of the valve and for pneumatic linkage. Constrained layer construction provides efficient exclusion of noise.

3,715,526

MINIATURIZED ELECTRIC CORD REEL

Charles H. Blanch, Maple Heights, and James W. Kovacik, Parma, both of Ohio, assignors to Alert Stamping & Mfg. Co., Inc., Bedford Heights, Ohio

Continuation-in-part of Ser. No. 859,701, Sept. 22, 1969, Pat. No. 3,619,518. This application March 15, 1971, Ser. No. 124,328
Int. Cl. H02g 11/00
U.S. Cl. 191—12.2 R 13 Claims



An improved electric cord reel construction is provided that is characterized by its miniature size. The simplified, relatively small structure is lightweight, relatively inexpensive to manufacture and assemble. The principal component part of the reel is preferably molded from plastic and has combined features normally supplied by additional, different parts secured together by various fasteners, thereby avoiding in the present structure the usual overall heavy, relatively bulky assembly. In one form, this component comprises a unitary, cup-shaped member which is so compactly designed as to include a hub portion on which an electric cord reel is wound, a flange for

guiding the deposition of the cord, commutator rings to receive and transmit electrical energy to the cord, a bearing for mounting a shaft around which the unitary member relatively rotates, and a housing for a coiled spring adapted to maintain the reel in a home position. The cup-shaped member receives and supports a second flange in spaced relation to its own flange, preferably at a spaced apart distance substantially equal to the width of a single electric cord.

3,715,527

ROTARY SWITCH WITH DOUBLE NOSED CONTACTS FIXEDLY SECURED TO STATOR SECTION

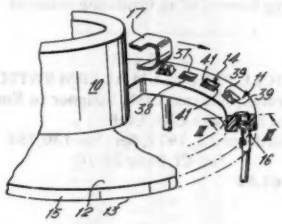
Franco Trevisiol, and Mario Bergonzi, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 1, 1971, Ser. No. 148,358

Claims priority, application Italy, June 27, 1970, 26693 A/70

Int. Cl. H01h *19/58, 21/78*

U.S. Cl. 200—11 K **3 Claims**



A rotary switch includes a base plate having spaced holes each of which receives an electrical contact. A wiper arm is arranged to wipe contact surfaces of the contact projecting out of the holes.

Each contact has a portion for connection to a conductor and a contact portion for engagement with the wiper arm. The contact portion has a part shaped as a channel having sides and a base. Two extensions project from the ends of the channel sides, the extensions bending back to form at the bends, contact surfaces disposed generally perpendicularly to the travel path of the wiper arm. The ends of the extensions are formed as spring tongues which are arranged to snap behind shoulders provided in the associated hole to prevent withdrawal of the contact.

3,715,528

CENTRIFUGAL ADVANCE DEVICE FOR AN IGNITION DISTRIBUTOR

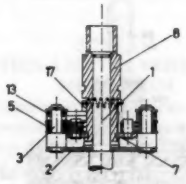
Roger Habert, Epinay/Seine, France, assignor to Ducellier & Cie, Paris, France

Filed June 24, 1971, Ser. No. 156,207

Claims priority, application France, July 10, 1970, 7025775

Int. Cl. H01h

U.S. Cl. 200—19 R **3 Claims**



A centrifugal advance device for an ignition distributor for an internal combustion engine wherein there are provided two main flywheel masses and two auxiliary flywheel masses. The main masses are each pivotable on a pin mounted on a plate which is connected to a drivable shaft and the auxiliary masses are coupled to the main masses. These masses are adapted on rotation of said shaft to displace a plate connected to a cam which is adapted to actuate a contact-breaker arm for obtaining a variation in the timing of the spark. The auxiliary masses are arranged to move the main masses in their angular displacement during a first stage of variation corresponding to a lower region of engine speed. After the engine speed has passed through this lower region, two abutments fixed to the

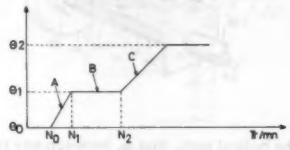


plate connected to the control shaft prevent further angular movement of the auxiliary masses and main masses, thus providing an intermediate region of engine speed during which the timing of the spark does not vary. As the engine speed increases still further into an upper region spring means acting on said masses are overcome to permit further angular movement of the main masses and thus further angular movement of the plate connected to said cam.

3,715,529

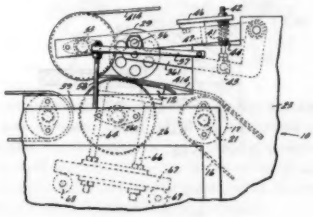
SWITCH DEVICE FOR COUNTING FLAT ARTICLES

Allen H. Lloyd, Terrace Park, Ohio, assignor to Tech-Art, Inc., Milford, Ohio

Filed Dec. 29, 1971, Ser. No. 213,333

Int. Cl. B65g *43/00*

U.S. Cl. 200—46 **8 Claims**



A switch device for counting articles that includes a shoe member having an elongated portion extending cantilever-fashion over a body thereof to adjacent a head of a plunger. Flat articles such as carton blanks are directed over the shoe member to pass over the head of the plunger. An elongated leaf spring attached to the body has a portion extending cantilever-fashion under a foot of the plunger to urge the plunger outwardly. A switch element is mounted with a push button thereof engaging the spring. A first jack screw extends between the cantilever-extending portion of the shoe member and the body and a second jack screw extends between the base member and the spring member.

3,715,530

ACTUATING DEVICE

Thomas B. Dalton, Muskegon, Mich., assignor to Westram Corporation, Muskegon, Mich.

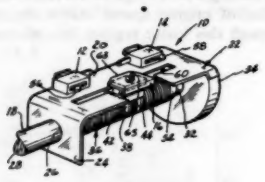
Continuation-in-part of Ser. No. 4,883, Jan. 22, 1970, abandoned. This application Aug. 24, 1971, Ser. No. 174,453

Int. Cl. H01h *3/16*

U.S. Cl. 200—47 **8 Claims**

A device for actuating a pair of spaced limit switches in which an actuating member is reciprocably mounted for

movement between the limit switches. The device comprises a rotatably mounted shaft having a wire wound around a selected length of the shaft and defining a helical path. The opposite ends of the wire are fixed to the shafts in such a manner that when a portion of the actuating member is



disposed in the helical path, that is, between any two adjacent turns of the wire, the adjacent sides of each of the remaining successive turns of the wire are normally in abutment. As the shaft is rotated in opposite directions, the wire reciprocally drives the actuating member between the limit switches.

3,715,531

DISTRIBUTOR HOUSING AND PLATE ASSEMBLY WITH ROTATABLE CLAMPING MEANS

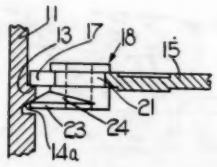
Gordon Keeley, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 20, 1971, Ser. No. 164,313

Claims priority, application Great Britain, July 23, 1970, 35,694/70

Int. Cl. H01h *9/02*; **E05c** *3/04, 3/14*

U.S. Cl. 200—19 R **4 Claims**



An ignition distributor for a road vehicle, wherein the hollow casing of the distributor is formed internally with a support surface, and the contact breaker assembly base plate of the distributor is engaged with the support surface. A pair of cam members are engaged with the base plate and the casing, and are operable upon rotation, to clamp the base plate against said support surface.

3,715,532

ENCAPSULATED HIGH VOLTAGE-SWITCHING INSTALLATION

Tibor Morva, Oberentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

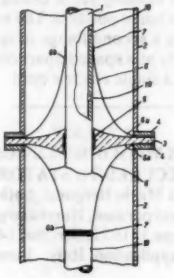
Filed Dec. 21, 1971, Ser. No. 210,366

Claims priority, application Switzerland, April 19, 1971, 5629/71

Int. Cl. H01b *9/04*

U.S. Cl. 174—28 **4 Claims**

An encapsulated high voltage-switching installation, the cylindrical conductor of which serves to carry a high voltage and is surrounded by a grounded cylindrical sheath filled with an insulating gas. The conductor is concentrically attached within the sheath by means of insulating supports. According to important aspects of this invention at least one trumpet-shaped foil possessing a rotationally symmetrical construction and widening in the axial direction of the conductor is ar-



ranged between the conductor and the sheath, this trumpet-shaped foil being formed of an insulating material.

3,715,533

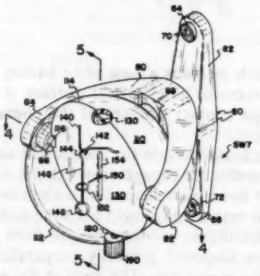
VEHICLE PENDULUM ALARM SWITCH

William Joe Seaton, Kearns, Utah, assignor to Emdeko International, Inc., Salt Lake City, Utah

Filed April 2, 1971, Ser. No. 130,754

Int. Cl. B60r *25/10*

U.S. Cl. 200—61.52 **2 Claims**



An alarm system for automobiles and other vehicles is disclosed in which pendulum switches are provided, including one wherein the sensitivity can be readily adjusted.

3,715,534

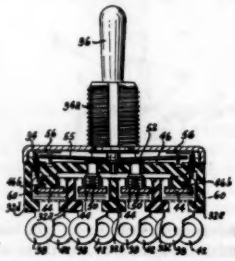
MINIATURE MULTI-POLE TOGGLE SWITCH WITH MOMENTARY ACTION

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer Inc., Milwaukee, Wis.

Filed Aug. 2, 1971, Ser. No. 167,964

Int. Cl. H01h *13/28*

U.S. Cl. 200—67 G **10 Claims**



Three and four pole toggle switches. Miniature size is attained by providing springs affording contact pressure that

require a minimum of space and by providing momentary action spring structure that can be incorporated in the same dimensional housing as used for the non-momentary action switches.

3,715,535

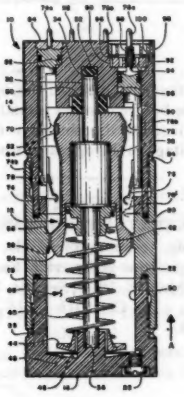
ACCELERATION ACTUATED SWITCH

Ruben S. Urenda, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed July 20, 1971, Ser. No. 164,378

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.53 **4 Claims**



An electrical switch actuatable at one or more levels of acceleration including a sealed tubular housing having spaced apart reset actuate walls with damping fluid filling a chamber therebetween, a movable sensing mass within the chamber carrying a shorting conductive member, a helical spring intermediate the actuate wall and the sensing mass to position the sensing mass at an initial location adjacent the reset wall and to resist movement of the sensing mass when the mass is subjected to acceleration forces, electrical contacts extending through the housing walls into the chamber in the path of movement of the shorting member, and means carried by a housing wall accessible from the exterior of the housing for moving at least one of the contacts to a position in substantially transverse alignment with another contact for generally simultaneous contact with portions of the shorting member after some desired movement of the sensing mass. Provision is also made by means of an annular orifice to minimize circuit closures from extraneous shocks and by a bimetallic curved ring to compensate for temperature caused changes in spring characteristics.

3,715,536

SWITCH WITHIN A MOTOR VEHICLE DOOR LOCK MECHANISM

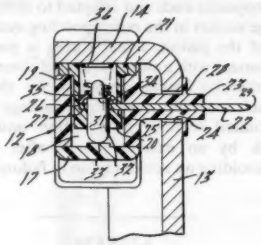
Albert Husch, Pulheim; Franz Kemenes, Cologne, and Ludwig Pregel, Dansweiter, all of Germany, assignors to Ford Motor Company

Filed Sept. 13, 1971, Ser. No. 179,892

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.64 **11 Claims**

A switch device in a motor vehicle door latch mechanism. The latch mechanism includes a resilient wedge yieldable in a direction transversely of the door closing movement. A switch contact component is housed within a chamber in the wedge. In unlatched condition of the latch mechanism, the switch contact component closes an electrical circuit from a ground lead in the wedge to the latch mechanism metal support plate. The circuit may be used to control a warning light, passenger compartment interior lights or a warning buzzer.



Upon the latch mechanism being placed in latched condition when the door is closed, the switch contact component is moved out of contact with the ground lead in response to yielding movement of the wedge as the latter is engaged by a latch bolt or the like.

3,715,537

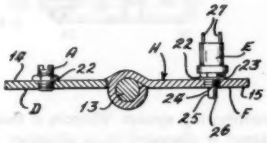
HINGE MOUNTED MICROSWITCH WITH ADJUSTABLE ACTUATOR PIN MOUNTED ON ADJACENT LEAF

Francis C. Peterson, Affton, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Filed Aug. 27, 1971, Ser. No. 175,594

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.7 **4 Claims**



A hinge wherein the leaves are pivotally secured together on a pin, one of said leaves having an electric switch connected thereto which contacts cooperating means connected to the other leaf for sounding an alarm or activating a signal when the door is not in its closed position or to activate some means when the door is in its closed position.

3,715,538

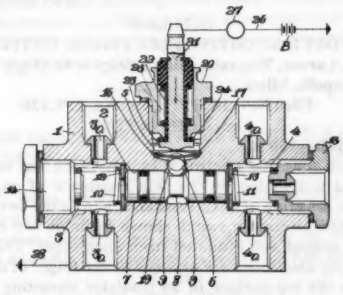
HYDRAULIC PRESSURE DIFFERENTIAL SWITCH WITH SNAP OVER LEAF CONTACT

Shinya Ito, Tsushima, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Japan

Filed May 7, 1971, Ser. No. 141,141

Int. Cl. H01h *35/38, 13/38*

U.S. Cl. 200—82 D **7 Claims**



A switch assembly for detecting a difference in hydraulic pressure and capable of detecting and issuing an alarm if

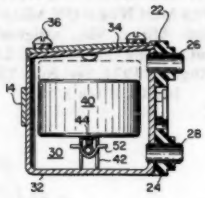
leakage occurs in either one of two hydraulic pressure systems independent of each other, such as the pressure systems for the front and rear brakes in a motor-car, by means of an equilibrating piston acted on by the two independent pressures on its opposite ends and adapted to shift toward one end when leakage occurs in the corresponding system. In response to shifting of the piston, a leaf spring is pushed upward to come into contact with a switch terminal connected to a warning circuit thereby issuing an alarm for the leakage. The present switch assembly has the advantage that the alarm remains actuated without interruption until the spring is pushed back by an external force after repair, thereby completely avoiding an accident due to failure in repairing the leakage.

3,715,539

FLUID LEVEL MONITORING SYSTEM

Paul A. Silberg, Cochituate, and John R. Lewis, Cambridge, both of Mass., assignors to Harnessed Energies, Inc., Newton, Mass.

Filed Dec. 10, 1970, Ser. No. 96,765
Int. Cl. H01h *36/02*
U.S. Cl. 200—84 C **5 Claims**



A fluid monitoring system wherein a float having a permanent magnet is disposed in a chamber containing fluid therein. The magnet is disposed on the bottom of the float. A hollow tube passes through the lower portion of the chamber and is sealed in a fluid-tight manner at either end thereof. A magnetic reed switch is disposed in the tube and is connected to a circuit which provides a visual indication when the reed switch is actuated. If the level of the fluid in the chamber decreases to a predetermined level, the float level decreases solely as a function of the fluid level in the chamber. The magnetic field created by the permanent magnet when adjacent the reed switch disposed in the tube in the chamber will actuate the switch which provides a visual indication that the predetermined lower level has been reached. If the level of fluid in the chamber increases, the float moves upwardly as the liquid level increases, the magnet moves away from the reed switch, and the indicator would be deactivated.

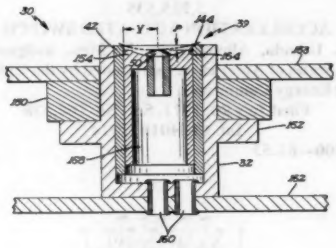
3,715,540

TOUCH SENSITIVE ELECTRONIC SWITCH

Willis A. Larson, Wayzata, Minn., assignor to Magic Dot, Inc., Minneapolis, Minn.

Filed Nov. 16, 1971, Ser. No. 199,226
Int. Cl. H01h *35/00*
U.S. Cl. 200—159 R **2 Claims**

A touch sensitive electronic switch which has no moving parts and is actuated by the skin resistance of an operator causing a lowering of D.C. resistance across the switch is disclosed. The electronic switch shown includes two electrodes laterally spaced and insulated from each other. The top surfaces of the electrodes are exposed to the finger of the operator upon the top surface of an insulator mounting the electrodes in a manner that the operator's finger first touches an outer electrode and then an inner electrode to allow a direct current path to be set up laterally between the outer electrode and the inner electrode to thereby provide a lowering of the D.C. resistance across the switch. The relationship of the top surface of the outer electrode and the top surface of the inner



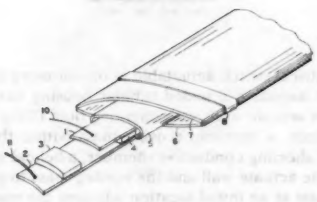
electrode insures that the finger of the operator first touches the outer electrode before contact is made between the finger and the inner electrode to thereby allow the harmless grounding of the usual voltage in the operator's body.

3,715,541

CUSHION SEAT SWITCH SENSOR MEANS

Robert H. Koenig, Huntington Hills, N.Y., assignor to Tapeswitch Corporation of America, Farmingdale, N.Y.

Filed May 18, 1971, Ser. No. 144,584
Int. Cl. H01h *13/16*
U.S. Cl. 200—86 R **3 Claims**



A ribbon switch is provided for operating on cushioned seats, for instance, between the spring and padding of automobile seats. First and second flexible conductive strips are normally separated by a plurality of insulating members sandwiched between them. The insulating members are spaced so as to hold the conductive strips separated unless the conductive strips are flexed or bowed; as for instance, into a soft cushion by someone sitting on them. The spacing of the insulating members and the flexibility of the strips is chosen so that after a predetermined amount of flexing, the conductive strips will snap together forming a good electrical contact. The strips are held together by an appropriate sleeve. The outer cover consists of two flexible strips having transverse curvature placed convexly opposing to form a central shaftway.

3,715,542

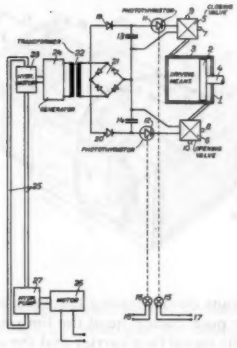
CONTROL MEANS FOR PNEUMATICALLY OPERATED HIGH VOLTAGE SWITCHING DEVICE

Per-Olof Grune; Walter Pucher, and Hugo Sandkvist, all of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 8, 1969, Ser. No. 883,134
Int. Cl. H01h *33/54*
U.S. Cl. 200—148 R **4 Claims**

A high voltage switching device is operated by a compressed gas valve having an electrodynamic operating means. The operating means comprises a stationary coil which is in-

ductively connected to a short-circuit winding supported by the movable member of said valve. To operate the switching



device a capacitor located at high potential is connected to said coil through a photo-electric switching member.

3,715,543

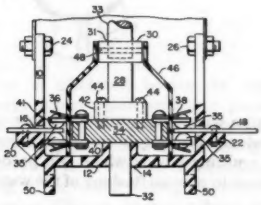
ROTARY ELECTRICAL SWITCHING CONTACT ASSEMBLY WITH HOLLOW INSULATING ARC BARRIER

August I. Keto, Sharon, and Robert J. Manes, Wheatland, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 12, 1971, Ser. No. 105,797

Int. Cl. H01h *9/32, 33/06, 21/54*

U.S. Cl. 200—151 **2 Claims**



An electrical switching contact assembly having a housing with stationary contacts mounted thereon, and a rotating shaft with movable contacts attached thereto. The rotating shaft is mounted within the housing in a manner which will permit the stationary and movable contacts to engage when the switch is closed. The housing and shaft are constructed to permit stacking of the assembly for polyphase switching operations. An insulated hollow arc barrier member is disposed around the movable contact assembly.

3,715,544

ELECTRIC TOOTHBRUSH

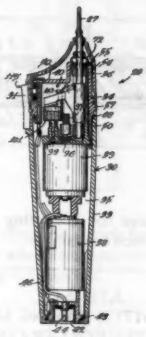
John P. Duve, Brookfield, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Division of Ser. No. 824,110, May 13, 1969, Pat. No. 3,588,936. This application April 1, 1971, Ser. No. 130,099

Int. Cl. H01h *23/24, 9/06, 3/50*

U.S. Cl. 200—157 **6 Claims**

A switch for an electric cordless toothbrushing device comprising a switch actuator with raised projections, which projections engaged spaced wire members thereby detenting the



switch actuator in either a contact make or contact break position.

3,715,545

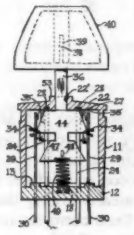
MOMENTARY PUSH BUTTON SWITCH WITH IMPROVED NON-CONDUCTIVE CAM FOR NORMALLY RETAINING MOVABLE LEAF SPRING CONTACTS IN A NON-OPERATIVE POSITION

Eric L. Long, Waukegan, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed June 18, 1971, Ser. No. 154,512

Int. Cl. H01h *3/12, 13/62*

U.S. Cl. 200—159 A **8 Claims**



An electrical switch of the push-button type including an actuator movable through a switch housing, with the actuator providing a cam head which when in its original or unactuated position, physically separates the contact ends of the switch blades within the housing, thereby preventing undesirable closing of the switch resulting from shock, vibration, or teasing, while permitting a full actuating movement and harmless overtravel of the actuator so as to positively assure proper and complete switch blade closure.

3,715,546

POSITION INSENSITIVE MERCURY SWITCH HAVING A MAGNETICALLY ACTUATED SLUG FLOATING IN MERCURY

Sheldon S. Bitko, Cherry Hill, N.J., assignor to Fifth Dimension Inc., Princeton, N.J.

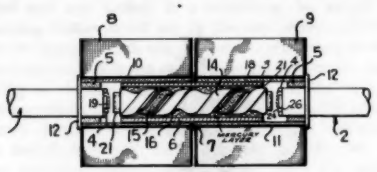
Continuation-in-part of Ser. No. 880,128, Nov. 26, 1969, Pat. No. 3,644,693. This application Sept. 11, 1970, Ser. No. 71,294

Int. Cl. H01h *1/08, 29/06*

U.S. Cl. 200—166 C **14 Claims**

A mercury switch including an elongated shuttle floating in

mercury, the ends of the shuttle constituting switch contacts including mercury wettable anters, each surrounded by a tantalum or niobium spacer for accepting mechanical impact against the opposing switch contact.



3,715,547

ELECTRICAL SWITCH HAVING AN OBLIQUELY ORIENTATED ROLLER CONTACT

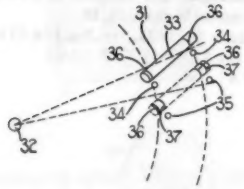
Steven John Tregurtha, Oswaldtwistle, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed March 30, 1971, Ser. No. 129,454

Claims priority, application Great Britain, May 16, 1970, 23,833/70

Int. Cl. H01h *9/00*

U.S. Cl. 200—166 BB **2 Claims**



An electrical switch comprises a base, a cover extending over the base and a rotor mounted between the base and the cover for angular movement relative thereto. A conductive roller is carried by the rotor and defines the movable contact of the switch, resilient means urging the roller into contact with the base. A pair of fixed contacts are carried by the base and are engageable by the roller in a predetermined angular position of the roller. The roller is carried by the rotor so that the rotational axis of the roller is parallel with the base but is inclined at an angle to an imaginary line joining the axis of movement of the rotor to the center of gravity of the roller, whereby during angular movement of the roller over the pair of fixed contacts the surface of the roller undergoes sliding movement as well as rotational movement relative to the fixed contacts and so provides a cleaning action to the contacts.

3,715,548

PUSH BUTTON SWITCH POSITION INDICATOR

Rudolf H. Schadow, Konigsbacher Zeile 23, Berlin, 28, Germany

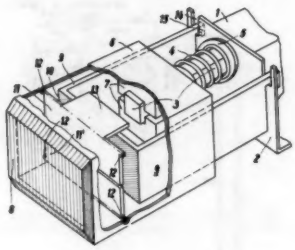
Filed March 20, 1972, Ser. No. 236,109

Claims priority, application Germany, March 25, 1971, P 21 14 526.6; June 15, 1971, P 21 29 688.8

Int. Cl. H01h *9/16*

U.S. Cl. 200—167 R **19 Claims**

A push button switch having a switch operation indicating means comprising a signal face arranged behind a window in the push button head. When the push button of the switch is depressed the signal face lies adjacent the window and when it is not depressed it is removed from it. The switch is provided with at least one covering shutter in the push button head and this shutter is arranged to pivot about an axis which is perpendicular to the axis of the switch. The covering shutter has a limb extending approximately perpendicularly from the shutter. The covering shutter is swung open by the signal surface carrying means on depressing the push button head. On the return of the push button head the limb is so swung from the rear side of the signal face carrier that the covering shutter is swung back over the signal surface.



3,715,549

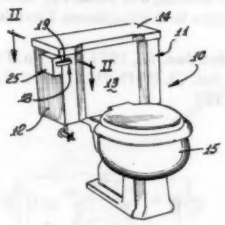
MUSICAL WATER CLOSET

Lillian G. Kraff, 468 South Roxbury Drive, Beverly Hills, Calif.

Filed May 22, 1972, Ser. No. 255,552

Int. Cl. H01h *3/02*

U.S. Cl. 200—172 A **7 Claims**



In combination with a conventional water closet having a water box, bowl, and flushing means, there is provided a music box or sound emitting device which will produce a pleasant sound in response to manual flushing of the water closet.

3,715,550

INDUCTION COOKING/WARMING APPLIANCE INCLUDING VESSEL SUPPORTING MEANS HAVING AN UNDULANT SURFACE AND TEMPERATURE SENSING MEANS ASSOCIATED WITH SAID SURFACE

John D. Harnden, Jr., Schenectady, N.Y., and William P. Kornrumpf, Schenectady, N.Y., assignors to General Electric Company

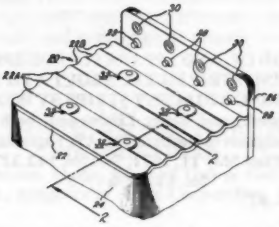
Filed Feb. 22, 1972, Ser. No. 228,135

Int. Cl. H05b *9/00*

U.S. Cl. 219—10.49 **17 Claims**

Disclosed herein is an induction range having a counter including an undulant top surface for supporting a cooking vessel. Since the counter is made of a material which is not inductively heatable the counter remains relatively cool during the cooking process, while the vessel is being inductively heated. Although the counter's top surface has undulations therein, it is, nevertheless, an unbroken surface; i.e., there are no openings therethrough. Moreover, even though the counter's top surface has undulations therein, it may, nevertheless, be relatively smooth so that it can be wiped clean, easily. Furthermore, temperature sensing means are arranged on the top sur-

face of the counter between adjacent undulations thereof and said sensing means are adapted to be contacted and easily



compressed by the bottom surface of a vessel resting on the counter's top surface; i.e., resting on the undulations.

3,715,551

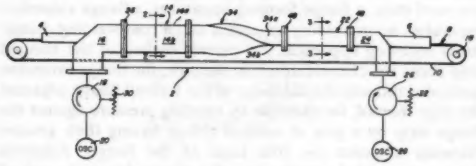
TWISTED WAVEGUIDE APPLICATOR

Robert A. Peterson, Canton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 1, 1971, Ser. No. 158,919

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55 **10 Claims**



An apparatus is disclosed having an electromagnetic waveguide energy transmission structure providing applied orthogonally disposed high frequency electric fields disposed around material being processed in one complete traversal. The resultant electric field intensity distribution provides for uniform heating of products having nonuniform cross-sectional configuration. Objects, such as rubber moldings or extrusions, may be uniformly cured by the orthogonal electric field orientation. The apparatus utilizes conveyor mechanisms for continuously feeding strip materials to be treated. The transmission structure may be of a hollow rectangular or circular configuration or a combination of both. To assist in the removal of any vapors or to maintain heating temperature, fluid circulation means are disposed over predetermined zones of the oven energy applicator.

3,715,552

HIGH FREQUENCY HEATING APPARATUS

Shiro Umezu; Sadad Takeda, both of Fujisawa; Kaoru Mitsudome, and Tetsuo Hashimura, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Kanagawa-ken, Japan

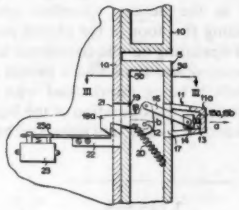
Filed March 3, 1971, Ser. No. 120,610

Claims priority, application Japan, March 4, 1970, 45/18133

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55 **10 Claims**

In high frequency heating apparatus, typically an electronic oven, the door locking mechanism comprises an operating member mounted on the door outside the heating chamber, a switch in the cabinet and means interlocked with the locking



mechanism for operating the switch for deenergizing the high frequency oscillator when the operating member is operated to unlock the locking mechanism.

3,715,553

HIGH-FREQUENCY HEATING EQUIPMENT

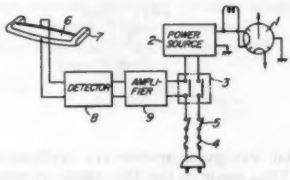
Morimasa Ogawa, and Kiyoshi Gono, both of Nara, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Oaza Kadoma, Kadoma-shi, Osaka, Japan

Filed June 25, 1970, Ser. No. 49,624

Claims priority, application Japan, July 3, 1969, 44/53623

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55 **6 Claims**



A high-frequency heating equipment in which a high-frequency generator is stopped when the handle of a door of a heating chamber is touched or grasped upon opening the door, thereby avoiding high-frequency waves from leaking out through a port of the heating chamber, thus preventing any accident imparting an impediment to the human body and simultaneously preventing any interference to other communication appliances.

3,715,554

HIGH FREQUENCY HEATING APPARATUS

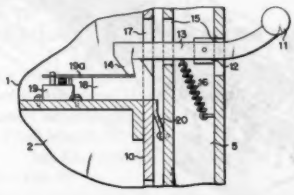
Shiro Umezu; Sadao Takeda, both of Fujisawa; Kaoru Mitsudome, and Tetsuo Hashimura, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed March 3, 1971, Ser. No. 120,649

Claims priority, application Japan, March 4, 1970, 45/18135

Int. Cl. H05b 9/06

U.S. Cl. 219—10.55 **10 Claims**



In a high frequency heating apparatus of the class comprising a cabinet defining a heating chamber having an access

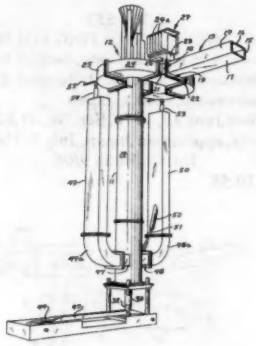
opening at one side thereof, a door mounted on the cabinet for closing the access opening, a high frequency oscillator mounted on the cabinet for radiating high frequency electromagnetic wave in the heating chamber and a locking mechanism for holding the door in the closed position, there are provided a door operating handle connected to the locking mechanism for operating the same and a switch mounted on the cabinet, the switch being interlocked with the locking mechanism for controlling the operation of the high frequency oscillator when the door is locked and unlocked by the locking mechanism.

3,715,555

CIRCULAR WAVEGUIDE MICROWAVE APPLICATOR

Ray M. Johnson, 155 Lipton Place, Danville, Calif.

Filed April 19, 1972, Ser. No. 245,410
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 **7 Claims**



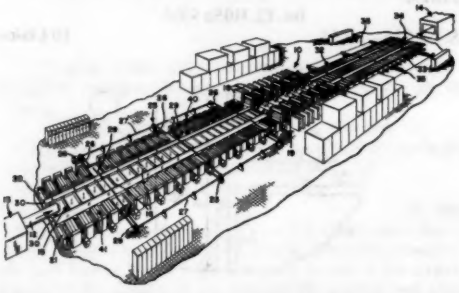
A circular waveguide microwave applicator is excited in either the TM_{01} mode or the TE_{11} mode by means of a hybrid input network receiving energy from a source of microwave power. The material being heated may be conveyed under gravity axially through the circular applicator and along the axis thereof, guided by a dielectric tube extending coaxially with the cylindrical side wall of the applicator. Remnant power is then conducted to terminating water loads connected to the applicator.

3,715,556

SLAB HEATING METHOD AND APPARATUS

Norbert R. Balzer, Parma, and Robert J. Kasper, Seven Hills, both of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Oct. 5, 1970, Ser. No. 78,088
Int. Cl. H05b 5/00, 9/00
U.S. Cl. 219—10.69 **5 Claims**



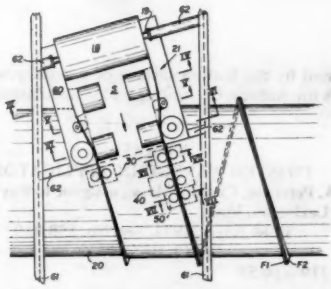
A preheated slab of metal is moved through induction heating units to raise its temperature prior to rolling. Electric radiant heating devices are spaced along the slab before and after it passes through the induction heating units to maintain the elevated temperature of the slab by directing radiant heat toward the slab in an amount sufficient to compensate for heat loss from the slab to the atmosphere.

3,715,557

METHOD OF, AND APPARATUS FOR SPIRALLY WINDING STRIP METAL ABOUT A PIPE, AND SECURING ADJACENT STRIPS BY WELDING

Sture Netterstedt, and Bengt Lindstrand, both of Fagersta, Sweden, assignors to Rostfria Tak AB, Fagersta, Sweden

Filed May 11, 1971, Ser. No. 142,327
Int. Cl. B23k 11/16
U.S. Cl. 219—62 **21 Claims**



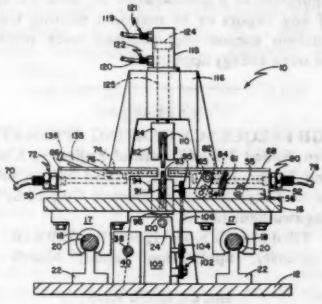
An annular carrier cage is placed around the pipe, which may be insulated. The carrier cage supports a holder for stainless steel strip, a flange forming apparatus, a flange extension apparatus, seam welding apparatus and a post-welding, flange stress relieving apparatus. To permit curling of the flanged strip about the circumference of the pipe, the flange extension apparatus reduces the diameter of the formed flange adjacent the edge thereof, for example by exerting pressure against the flange strip by a pair of conical rollers having their greater diameter adjacent the free edge of the flange. Adjacent flanges are welded together by roller electrodes, and a pair of conical rollers similar to the flange extension apparatus then bear against the welded joints to relieve stresses due to welding and provide for a tight wrap of the spiral, welded strip about the pipe.

3,715,558

WELDING APPARATUS

Thomas Alan McGill, Hamilton, Mass., assignor to The Gillette Company, Boston, Mass.

Division of Ser. No. 758,465, Sept. 9, 1968, Pat. No. 3,597,571. This application Sept. 29, 1970, Ser. No. 76,525
Int. Cl. B23k 11/06
U.S. Cl. 219—82 **2 Claims**



Welding sheets of 0.0015 inch thick stainless steel razor blade stock together by overlapping two ends of two sheets

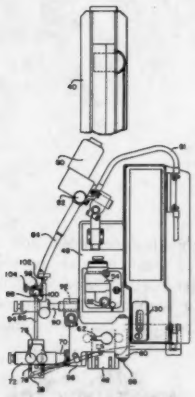
0.0040 inch, inserting the overlapped ends between the peripheral welding surfaces of two adjacent copper-tungsten alloy welding rollers, forming a spot weld under pressure by applying a 1,000 ampere, 60 cycle current at 3.8 volts to the rollers for 8 cycles, advancing the overlap longitudinally between the rollers for a distance about one-third the average length of the spot weld, stopping this advance and forming a second spot weld, and repeating this process until the entire overlap is welded.

3,715,559

VERTICAL WELDING MACHINE HAVING SWINGING EQUIPMENT HEAD

James E. Norcross, Media, Pa., and George Garwood, Philadelphia, Pa., assignors to Arcos Corporation, Philadelphia, Pa.

Filed April 10, 1972, Ser. No. 242,360
Int. Cl. B23k *9/12, 9/18*
U.S. Cl. 219—126 **4 Claims**



A vertical welding machine for welding the vertical weld groove between two plates or the like, having a vertically moving carriage which has a vertical pivot on which a swinging equipment head is positioned which supports the adjoining weld shoe, the snorkel and possibly also other equipment. In a vertical welding machine which has a carriage having outboard pressure support for the weld shoe remote from the vertical axis of its column, the machine may have roller support for the carriage on the opposite side of the vertical column to offset the deflection or distortion which may be caused by the pressure on the shoe.

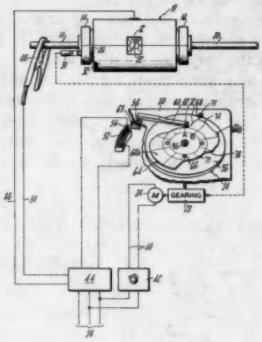
3,715,560

WELDING PROGRAMMER

John O. Emmerson, c/o Magnatech, The DSD Company, Bradley Park, East Granby, Conn.

Filed March 1, 1971, Ser. No. 119,735
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R **13 Claims**

A portable programmer for an automatic orbital tube welder comprises a turntable for mounting a shaped cam which is engaged by the stylus of a control arm to control the welding current through the use of a potentiometer having a wiper connected to the control arm. The turntable is rotated at a speed proportional to the speed of the welding head so that the rotation of the cam controls the welding current throughout all the orbits of the welder around the tube required to produce the weld. A support plate for indexing the cam on the turntable is mounted by a self-centering clutch



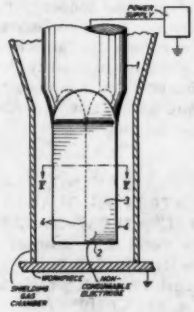
comprising a resilient O-ring carried by the turntable platen and a flange on the support plate having a locking taper for engaging the O-ring.

3,715,561

NON-CONSUMABLE ELECTRODE CONFIGURATION HAVING INCREASED ARC STARTING CAPABILITIES

Alf Martin Hammarlind, Vasteras, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed June 15, 1970, Ser. No. 46,045
Int. Cl. B23k *35/00*
U.S. Cl. 219—145 **4 Claims**



There is disclosed a non-consumable electrode for electric arc welding in a highly controlled inert atmosphere. In order to improve the initiating characteristics the rod-shaped electrode has at least one longitudinal edge starting from the end of the rod facing the arc, the edge angle of at least one of said edges being acute.

3,715,562

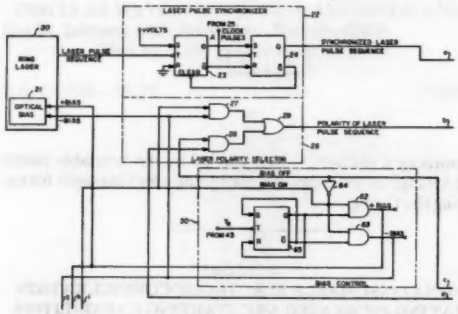
COMPUTER FOR USE WITH RING LASER ROTATIONAL RATE SENSORS

Joe B. Dendy, Phoenix, Ariz.; Kenneth Thomson, Lloyd Neck, and Robert F. Morrison, Halesite, both of N.Y., assignors to Sperry Rand Corporation

Filed March 19, 1970, Ser. No. 20,965
Int. Cl. G06f *15/20;* **G01b** *9/02*
U.S. Cl. 235—150.31 **22 Claims**

A computer responsive to the pulse sequence output signal of a ring laser rotational rate sensor having contra-rotating beams and biasing means to prevent mode locking. The bias-

ing means selectively changes the effective optical path length around the ring of one of the beams with respect to the other. The pulse repetition frequency of the laser output pulse sequence is representative of the difference in oscillation frequency between the contra-rotating beams. The computer comprises a bias control circuit for selecting the polarity of the bias applied to the ring and includes a compensation circuit for providing a bias compensation pulse sequence whose pulse repetition frequency is representative of the magnitude of the applied bias. The computer in addition provides signals representative of the polarities of the laser output pulse sequence and the bias compensation pulse sequence respectively. The laser polarity is chosen in accordance with the selected polarity of the applied bias. The polarity of the bias compensation pulse sequence is chosen opposite to the selected laser polarity. A pulse sequence combining circuit is included for combining the laser output pulse sequence and the bias compensation pulse sequence thereby providing a combined pulse sequence. The pulse sequence combining circuit furthermore combines the associated polarity signals thereby providing a combined polarity signal. The combined pulse sequence is integrated in accordance with the combined polarity signal for providing a signal representative of the ring about an axis normal thereto.



3,715,563

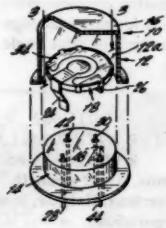
CONTACT HEATERS FOR QUARTZ CRYSTALS IN EVACUATED ENCLOSURES

Martin Bloch, New York, N.Y., assignor to Frequency Electronics, Inc., New Hyde Park, N.Y.

Filed April 19, 1971, Ser. No. 135,271

Int. Cl. H05b 1/00

U.S. Cl. 219—210 **1 Claim**



Thin metallic films are deposited on surfaces of quartz crystals in selected patterns and appropriate leads are provided to pass a current through the metallic film in order to heat same and thereby heat the crystals. The crystals are mounted in normal manner to an evacuated chamber. By use of the thin film contact heaters, temperature equilibrium is achieved at a much faster rate of time, with a higher rate of stability and with substantially reduced power consumption.

3,715,564

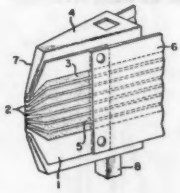
PRINTING HEAD FOR THERMAL PRINTER AND METHOD FOR MANUFACTURING SAME

Kfnji Hiruma and Inawo Sugaya, both of Tokyo, Japan, assignors to Ricoh Co. Ltd., Tokyo, Japan

Filed Sept. 9, 1971, Ser. No. 178,876

Intc. Cl. H05b 1/00

U.S. Cl. 219—216 **3 Claims**



A plurality of heating resistors and their lead wires are formed upon a heat-resistive flexible film, and the flexible film is then curved and mounted upon a head structure in such a manner that the heating resistors are arrayed along a projecting edge of the head structure.

3,715,565

SYSTEM FOR MAINTAINING LOW RELATIVE HUMIDITY IN CLOSURES

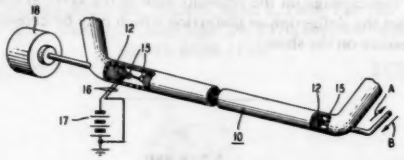
Wendell Glenn Nutt, Phoenix, Md., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 99,820, Dec. 21, 1970, Pat. No. 3,679,810.

This application Feb. 17, 1972, Ser. No. 227,050

Int. Cl. F22b

U.S. Cl. 219—274 **3 Claims**



This disclosure describes a system for maintaining a reduced level of relative humidity in telephone cables. A moisture-permeable tube of, for example, polyvinyl chloride with a pulp-insulated pair within it is included in the cable core. The pulp insulation, being a natural desiccant, absorbs moisture that passes through the tube wall from the cable, thus holding down the relative humidity inside the cable. When the pulp is saturated, a longitudinal flow of air coupled with applied electrical current sufficient to heat the pair, purges the moisture from the tube. The pulp insulation is ready thereafter to absorb moisture anew.

3,715,566

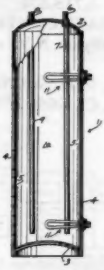
CORROSION GUARD SYSTEM FOR ELECTRIC WATER HEATER

Loerwood C. Wasson, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 125,209, March 17, 1971, abandoned. This application Jan. 24, 1972, Ser. No. 219,936

Int. Cl. F24h *1/00*

U.S. Cl. 219—322 5 Claims



A water heater tank has a sacrificial anode and an electric heating element assembly protected by a zinc coated sheath. The element is mounted on the tank wall with the sheath electrically insulated from the steel of the tank. A zinc block also may be mounted at the wall of the heating element assembly.

3,715,567

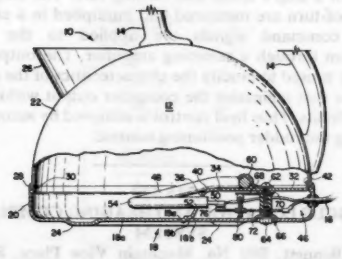
LIQUID HEATING ASSEMBLY

Ronald S. Mandziak, 85 Albert Avenue, Toronto, Ontario, Canada

Filed Nov. 4, 1970, Ser. No. 86,829

Int. Cl. H05b *1/02*; A47j *27/21*; H01h *37/22*

U.S. Cl. 219—437 2 Claims



An electric liquid heating assembly having a dome shaped upper wall and a flat bottom. A false bottom is mounted within the liquid heating assembly and defines a liquid-tight compartment. The false bottom is composed of a top wall and a lip. The top wall is spaced apart from the liquid heating assembly bottom and disposed parallel thereto and has an area substantially less than the area of the liquid heating assembly bottom. The lip depends downwardly from the top wall to the liquid heating assembly bottom. A thermo-sensitive element is mounted within the compartment and includes a resilient conductor, an insulator mounted to the conductor and a bi-metallic strip. When the temperature of the liquid within the liquid heating assembly exceeds a predetermined temperature, the bi-metallic strip contacts the insulator thereby applying a force to the conductor opposed to its bias and causing a contact, secured to the conductor, to move away from an electric terminal thereby de-energizing a heating element mounted with the liquid heating assembly.

ERRATUM

For Class 235—150.31 see:
Patent No. 3,715,562

3,715,568

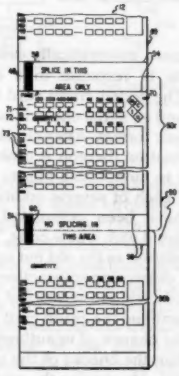
SYSTEM FOR GATHERING AND TRANSMITTING SOURCE DATA

Leo L. Azure, Jr., Richland, Wash., assignor to Automata Corporation, Richland, Wash.

Filed Nov. 16, 1970, Ser. No. 89,993

Int. Cl. G06k *5/00*

U.S. Cl. 235—61.7 R 32 Claims



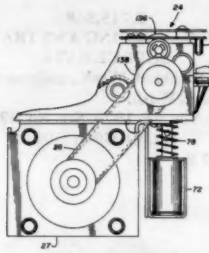
A data gathering and transmitting system includes apparatus for reading data encoded on elongated strips, such as conventional fan-fold strips, and functions in an edit operation for error checking of the read data and compilation of plural such strips, and in a transmit operation for transmitting the data to a central processing station. The fan-fold strip is conformed to a computer memory print out for convenience of marking thereof as in a quantity ordering application. Plural separate fan-fold strips may be spliced together, the reader automatically affording the splicing operation in the edit operation. The reader also effects error checking, including detection of marks of questionable integrity on the fan-fold strip as to reliability of reading as well as to improper marking, either in the omission of required marks, or in the provision of marks not permitted in the encoding format employed, and automatically positions the strip to identify the position thereon at which the error is detected, for human scrutiny and correction. During edit, therefore, the data is compiled and any error automatically identified for scrutiny and correction by the human operator; in the transmit operation, therefore, reliable and accurate transmission is assured. In an order mode, a receiver at the central station responds to the content and format of the data as received from the transmitter to afford an effective doubling of the content of the transmitted data for a given bit rate of transmission. Herein, the sequence of receipt of data words from each strip identifies the word and the related position of the central computer memory to which each such word relates. A change in the format automatically causes the system to switch to a cash mode in which the system functions to transmit and receive digital words of the prescribed format in accordance with the page identification and other encoded identification thereof, as required.

3,715,569

CREDIT CARD AUTOMATIC CURRENCY DISPENSER

John R. Hicks, Duncanville, and William C. Bortzfield, Fort Worth, both of Tex., assignors to Docutel Corporation, Dallas, Tex.

Filed July 29, 1970, Ser. No. 59,241
Int. Cl. G06k 7/08; G97f 1/06
U.S. Cl. 235—61.11 D 10 Claims



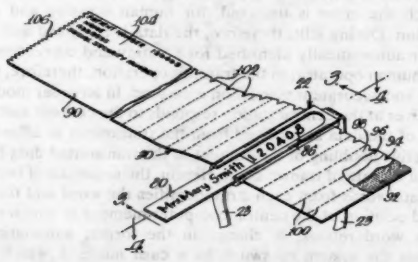
A currency dispenser automatically delivers a medium of exchange in packets in response to a coded credit card presented thereto. The coded credit card is presented to the currency dispenser and an initial check is made to determine if the card has the proper format. After checking the credit card format, coded information thereon is evaluated to check the user's identity prior to authorizing him to receive cash from the machine. When each of several additional checks of the credit card code have been completed, the old code is removed and substituted with a new code. The new code contains the same information as the old but updated to reflect an additional currency dispensing transaction. Both the original code and the updated code are scrambled in accordance with a changing key. Scrambling the credit card code after each use thereof minimizes the chance of unauthorized use of the currency dispenser. When the checks of the credit card code indicate the user is entitled to receive the amount of currency he has selected, a storage container for the packets of currency transports the required number of packets by a positive feed drive to a cash drawer. The cash drawer opens to a detent position which allows the customer to then move the drawer to a fully open position to remove his currency. Upon release of the cash drawer, it returns to a partially opened position from which it automatically closes after a preset time limit.

3,715,570

IDENTIFICATION SYSTEM

Theodore E. Weichselbaum, St. Louis, and Jack L. Wilhelmson, Fenton, both of Mo., assignors to Sherwood Medical Industries Inc.

Filed Dec. 2, 1970, Ser. No. 94,452
Int. Cl. G06k 19/06; G01d 15/12
U.S. Cl. 235—61.12 M 9 Claims



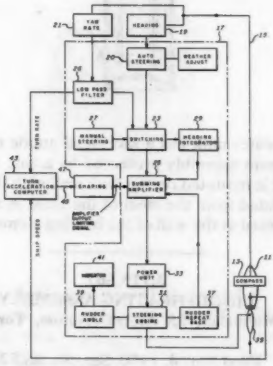
An identification bracelet attached to the arm of each patient entering a hospital dispenses a plurality of magnetically coded tags having an adhesive backing for attachment to samples, prescriptions and the like to uniquely identify the source individual. Tag readers located throughout the hospital decode the magnetic tags in order to correlate an analysis with the proper patient. In the patient's room, a portable battery operated cross-check reader compares a magnetically coded treatment tag with an identification tag from the patient's bracelet to prevent a treatment from being given to the wrong patient.

3,715,571

SHIP'S TURN RATE CONTROL SYSTEM

Frederick D. Braddon, Babylon, N.Y., assignor to Sperry Rand Corporation

Filed June 7, 1971, Ser. No. 150,495
Int. Cl. G06g 7/78
U.S. Cl. 235—150.2 3 Claims



A conventional ship's steering system is modified to limit the degree of heeling during turns by limiting the centrifugal force developed during such turns. The present invention utilizes the fact that centrifugal force is proportional to the product of a ship's speed and turning rate. The ship's speed and rate-of-turn are measured and multiplied in a computer. Rudder command signals are applied to the steering mechanism through a summing amplifier. The output of the computer is used to modify the characteristics of the amplifier to a value that maintains the computer output within the acceptable limits. Thus heel control is achieved by automatically regulating the rudder positioning control.

3,715,572

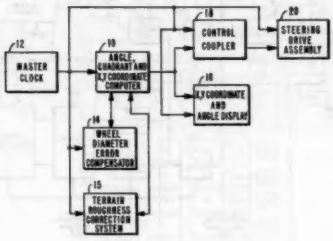
VEHICLE LOCATION AND HEADING COMPUTER SYSTEM

Dale E. Bennett, 801 No. Mountain View Place, Fullerton, Calif.

Filed March 5, 1971, Ser. No. 121,437
Int. Cl. G06f 15/50; A01b 69/04
U.S. Cl. 235—150.2 53 Claims

A system is provided in which pulses generated by the rotation of the wheels or tracks of a vehicle are processed to provide representations of the heading and location of the vehicle relative to X and Y coordinate axes. The angle between vehicle heading and the X axis is represented by the binary value stored in an angle register, the angle register being updated by the generated pulses each time the vehicle travels a predetermined distance. An associated quadrant register provides a binary representation of that one of the four quadrants of the coordinate system in which the vehicle heading is located. Binary representations of the vehicle location relative to the X and Y axes are stored in X and Y registers, which registers are updated in accordance with incremental changes in X and Y by computing the sine and cosine of the new angle stored in

the angle register upon each updating of the angle register. The stored angle and X, Y representations are converted into analog values to provide a visual display of the vehicle heading



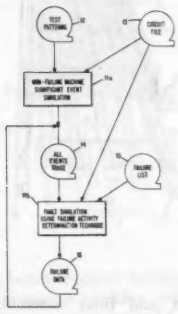
and location. The stored representations are also processed by apparatus which provides for operation of the vehicle over a predetermined course without the need for a driver or operator.

3,715,573

FAILURE ACTIVITY DETERMINATION TECHNIQUE IN FAULT SIMULATION

Robert E. Vogelsberg, Nichols, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed April 14, 1971, Ser. No. 133,999
Int. Cl. G06f *11/00*
U.S. Cl. 235—153 AC **5 Claims**



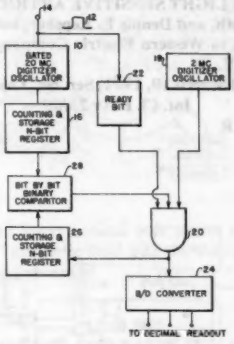
The failure activity determination technique of the present application represents a new approach to fault simulation designed to significantly reduce the time required to perform such simulations. This new technique may be used in conjunction with any interpretive fault simulation program (i.e., any program using list structures to trace and calculate circuit activity in a logic design). The improved technique consists essentially of using previously calculated good machine values during the fault simulation for any logic blocks that are not effected by the failure(s) being simulated. Thus, new values must be calculated for only a subset of the total logic circuitry. This subset, or failure partition, of the logic is determined dynamically during the fault simulation through the use of a series of flags within the circuit list structure.

3,715,574

INTERFACE CONVERTER FOR FEEDING HIGH FREQUENCY SIGNALS INTO LOW FREQUENCY CIRCUITS

Richard L. Gowan, Bonita, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 21, 1971, Ser. No. 164,564
Int. Cl. G06f *5/02, 5/06;* **H04l** *3/00*
U.S. Cl. 235—154 **1 Claim**



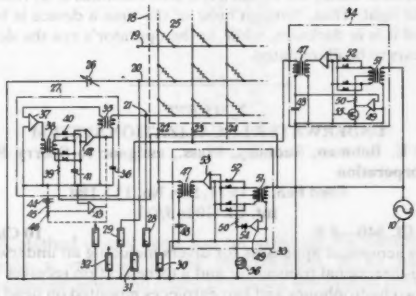
Apparatus for conversion of high speed binary to binary coded decimal with low speed circuitry. An information incoming pulse is digitized at the high frequency rate and this digital equivalent is stored in a first bit register. A low frequency digitizing oscillator is coupled through a gate circuit to a bit register identical to the first bit register and into a binary-to-digital converter. A bit by bit comparator compares the high frequency pulse count with the low frequency pulse count and produces a stop signal to the gate circuit when the low frequency count equals the stored high frequency count.

3,715,575

ANALOG COMPUTER FOR SOLVING SETS OF SIMULTANEOUS RELATIONS

John Hugh Davey Walton, 2 Broadfield Road, Kent, England

Filed March 9, 1971, Ser. No. 122,338
Int. Cl. G06g *7/34*
U.S. Cl. 235—180 **21 Claims**



An analog computer having a multiplexed negative feedback system comprising : an electrical network of impedances defining linear functions and which network is reciprocal between first and second sets of conductors of the network; and signal transmitting-receiving devices connected to said sets and which multiplex signals passing through the network between said sets in opposite directions. Solutions of the functions can be determined from the signals passing through the

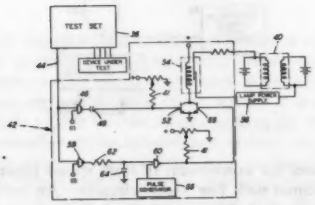
network in one direction from the transmitting-receiving devices connected to one of said sets when the system achieves equilibrium, and the signals passing through the network in the opposite direction from the other transmitting-receiving devices being negative feedback signals for controlling said devices connected to said one set of conductors. The multiplexing can be frequency or time multiplexing.

3,715,576

SYNCHRONIZED ILLUMINATION FOR OPERATIONS ON LIGHT SENSITIVE ARTICLES

John W. McGrath, and Dennis E. Repsher, both of Allentown, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed March 19, 1971, Ser. No. 126,217
Int. Cl. F21v *23/00*
U.S. Cl. 240—2 R **10 Claims**



A pulsable light source is synchronized with a test cycle during probe-testing of semiconductor devices. A high level of illumination is provided by energizing the light source to thereby assist an operator in viewing the probes and devices through a microscope between tests. During a test the light source is deenergized to eliminate the adverse effects of light on test results.

A typical test requires 10–20 milliseconds. Thus, the pulsable light source flashes at a frequency of approximately 50–100 flashes per second, appearing substantially continuous to the operator. Typically, the effects of light on semiconductor devices disappear within a few microseconds after removal of the light. Thus, through most of the time a device is being tested it is in darkness, while to the operator's eye the device appears to be illuminated.

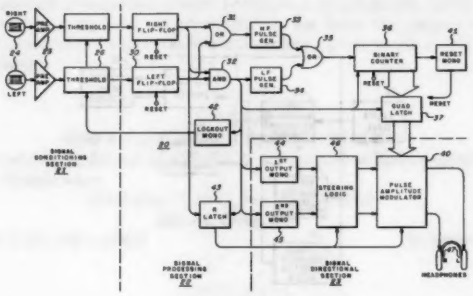
3,715,577

UNDERWATER LOCALIZATION SYSTEM

Carl E. Bohman, Sudbury, Mass., assignor to Sperry Rand Corporation

Filed Feb. 8, 1971, Ser. No. 113,184
Int. Cl. G01s *3/00*
U.S. Cl. 340—6 R **10 Claims**

An acoustical apparatus for divers including an underwater omni-directional transmitter and a three-section receiver having two hydrophones and two earpieces mounted on head gear worn by each diver. Pulse signals from the transmitter are sensed by the hydrophones disposed in a signal conditioning section of the receiver and are coupled through preamplifiers and detection circuits to bistable multivibrators in a signal processing section of the receiver. This latter section includes a pair of microcircuit pulse generators and a counter for determining the relative occurrence of the pulses and the time separation between the pulses. A third section of the receiver is comprised of monostable multivibrators, logic gates, attenuation circuits and bone conduction earpieces as output elements. This third section is responsive to the output signals



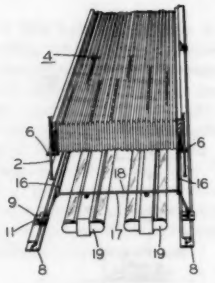
of the processing section and enables the diver to perceive the direction of the underwater transmitter.

3,715,578

LIGHT AND FILTER ASSEMBLY FOR CEILING STRUCTURE

Walter B. Wood; Bernard R. Schuler, both of Louisville; Charles A. Bromm, Fern Creek, and Wilson A. Welch, Louisville, all of Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Feb. 10, 1971, Ser. No. 114,181
Int. Cl. F21s
U.S. Cl. 240—9 R **6 Claims**



A modular light and filter assembly arranged to be suspended from ceiling superstructure with the light assembly being removably supported directly below the filter assembly in an arrangement maximizing laminar flow of the gases to be treated by the filter assembly.

3,715,579

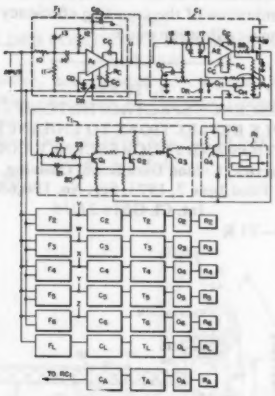
RATE DECODER WITH ACTIVE FILTERS

Roger Eblovi, Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 22, 1970, Ser. No. 82,916
Int. Cl. B60l *15/06;* **H01h** *47/20*
U.S. Cl. 246—187 A **13 Claims**

The decoding system provides a control signal in response to an input of one of a plurality of selected code rates. The improvement includes a band-pass filtering means for each code rate which is responsive to the input for producing the output when the rate is within the band of the filter. A comparator means has a triggering level responsive to the filter output and

produces a step signal when the amplitude of the filter output exceeds the triggering level. An output means responsive to



the step output of the comparator produces the control signal when the step output signal occurs at at least a minimum rate.

3,715,580

MULTI ELECTRON BEAM APPARATUS

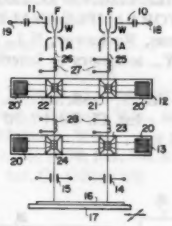
Akiji Maekawa; Chusuke Munakata, both of Kodaira, and Norio Saitou, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed March 4, 1971, Ser. No. 120,975

Claims priority, application Japan, March 4, 1970, 45/17888

Int. Cl. H01j *37/00*

U.S. Cl. 250—49.5 TE **8 Claims**



A multi-electron beam recorder having a new type electron lens composed of common exciting coils and a plurality of closely spaced pole piece parts excited by said coils. Electron beams pass through the respective pole piece parts and are focussed therein to impinge on a plurality of photographic plates and to record desired IC patterns thereon.

3,715,581

RAPID SCANNING DOUBLE FOCUSING MASS SPECTROGRAPH

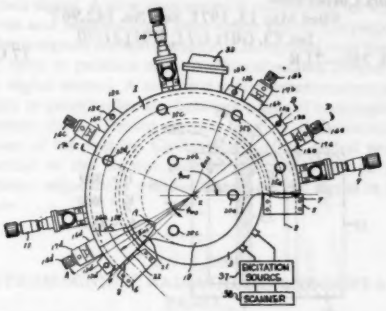
Hisashi Matsuda, Toyonaka, Japan, assignor to Nihon Denski Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 702,469, Feb. 1, 1968, abandoned. This application June 15, 1970, Ser. No. 46,178

Int. Cl. H01j *39/34*

U.S. Cl. 250—41.9 ME **6 Claims**

A rapid scanning double focusing mass spectrograph having a source of ions, means for producing a toroidal electric field, means for producing a homogeneous magnetic field and means for producing an r^{-1} magnetic field, wherein the r^{-1} magnetic field and the homogeneous magnetic field are excited simultaneously with a single energizing magnet and upper and lower parallel pole pieces of the means for producing a homogeneous magnetic field are secured to the rear ends



of the upper and lower conical pole pieces of the means for producing an r^{-1} magnetic field with the curvature radii of the two means being kept equal.

3,715,582

METHOD OF AND APPARATUS FOR ATTAINING FOCUSING FOLLOWING VARIATION IN MAGNIFICATION IN ELECTRON MICROSCOPE

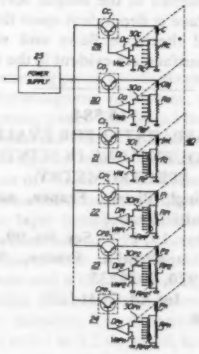
Hiroshi Akahori; Morioki Kubozoe; Toshihiro Furuya, and Sadayasu Ueno, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1970, Ser. No. 65,996

Claims priority, application Japan, Feb. 13, 1970, 45/40945; May 15, 1970, 45/12377

Int. Cl. H01j *37/10*

U.S. Cl. 250—49.5 A **8 Claims**

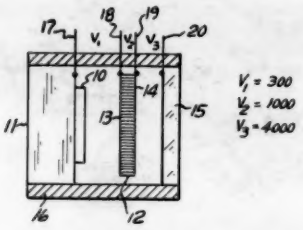


A method of and apparatus for attaining the focusing following a variation in the magnification in an electron microscope having an image producing lens system consisting of three or more lenses or generally n lenses including at least an objective lens, an intermediate lens and a projective lens. Means are provided in the apparatus so that, when the value of excitation current for the magnification varying lens is varied to vary the magnification, the excitation current supplied to the focus adjusting lens can be set at a value corresponding to the variation in the magnification, whereby the focusing following the variation in the magnification by the magnification varying lens as well as the adjustment of the intensity of illumination can be achieved by a single regulating operation.

3,715,583
SURFACE IMAGING UTILIZING EXOELECTRON EMISSION

Peter F. Braunlich, Bloomfield Hills, Mich., assignor to The Bendix Corporation

Filed May 13, 1971, Ser. No. 142,967
Int. Cl. G01t 1/11; H01j 31/50
U.S. Cl. 250—71 R **17 Claims**

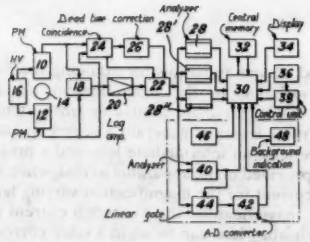


A system for obtaining an image of a surface by utilizing exoelectron emission is described. Surface characteristics such as homogeneity, microscopic flaws and discontinuities in the work function and defect distribution across the surface of the sample can be imaged by detecting the exoelectrons which are emitted from the surface under controlled conditions. The system includes a channel electron multiplier which is positioned in the proximity of the sample under study. The sample is heated to a temperature which enhances exoelectron emission. Exoelectron emission can also be stimulated by illuminating the substance with light or by stressing, cutting, or impacting the material. The emitted exoelectrons are detected by the multiplier and the multiplier emits secondary emission electrons in response to the exoelectrons. A phosphor screen receives the secondary emission electrons and yields a visual output in response thereto. Because the exoelectrons strike the multiplier at positions corresponding to positions from which they emanated from the sample surface, a visual image of the surface is obtained at the output screen. Exoelectron emission from a surface is dependent upon the characteristics of the surface, and therefore flaws and variations in the homogeneity of the surface are evident in the visual image.

3,715,584
METHOD AND APPARATUS FOR EVALUATING THE DEGREE OF QUENCHING IN SCINTILLATION SPECTROMETRY

Emmanuel Rosenstingl, Plaisir, France, assignor to Intertechnique S.A., Plaisir, France

Filed Nov. 17, 1970, Ser. No. 90,362
Claims priority, application France, Nov. 21, 1969, 6940184; Oct. 29, 1970, 7039133
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R **20 Claims**

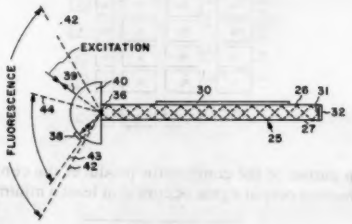


For evaluating the degree of quenching in a liquid scintillation sample, the pulse height corresponding to the centroid of part at least of the net count rate — pulse height spectrum due to a radioisotope in the sample or to an external standard is determined and compared with a calibration curve. Provision is made for subtraction of the contribution of the background noise. Determination of the counting efficiency is made by interpolation on a calibration curve.

3,715,585
FLUORESCENCE SPECTROPHOTOMETRY USING MULTIPLE REFLECTIONS TO ENHANCE SAMPLE ABSORPTION AND FLUORESCENCE COLLECTION

Nicolas J. Harrick, Croton Dam Road, Ossining, N.Y.

Filed June 7, 1971, Ser. No. 150,687
Int. Cl. G01n 21/16
U.S. Cl. 250—71 R **14 Claims**

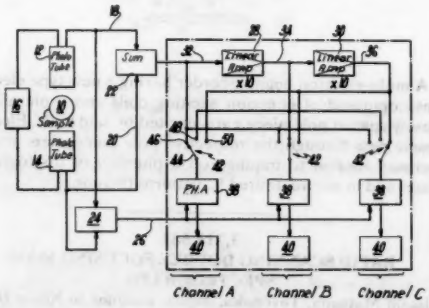


Apparatus for enhancing the sensitivity of fluorescence spectrophotometry is described. Enhanced sensitivity is obtained by a novel sample cell construction in the form of a flat plate providing multiple exposure of the sample to the exciting radiation to increase absorption, and providing concentration of the fluorescent radiation to a small aperture for more efficient collection. The novel cell also provides easy separation of the exciting and fluorescent radiations.

3,715,586
LIQUID SCINTILLATION SPECTROMETRY SYSTEM FOR SAMPLE ANALYSIS

Edward W. Thomas, Rockaway, N.J., and Edward Rapkin, Huntington, N.Y., assignors to Intertechnique S.A., Paris, France

Filed Feb. 5, 1968, Ser. No. 703,153
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R **12 Claims**



A liquid scintillation spectrometer system includes several discriminator channels and a single amplification chain consisting of several pre-adjusted linear amplifiers providing, for example, three pre-adjusted ranges in the gain ratios of 1, 10, 100. Thus 32P can be counted in a channel with a gain of 1 and tritium can be counted in a channel with a gain of 100. A range switch proceeds each pulse height analyzer permitting any isotope to be counted in any channel. In an alternative

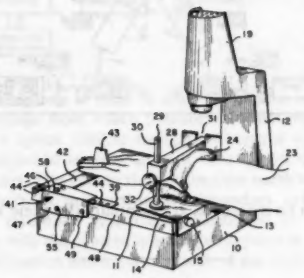
system, similar in principle, signals are taken from several dynodes of the photomultipliers, for example the ninth dynodes, the 11th dynodes and the 13th dynodes.

3,715,587

LIMB HOLDER POSITIONER FOR BONE MINERAL ANALYZER

Robert Burkhalter, and George L. Congdon, both of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Oct. 26, 1970, Ser. No. 83,945
Int. Cl. G03b *41/16*
U.S. Cl. 250—50 **10 Claims**



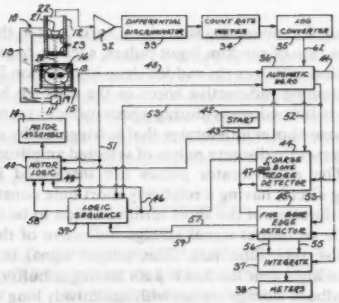
The disclosure relates to instruments for performing in vivo analysis of bone mineral content by measuring the absorption of a scanning beam of monoenergetic photons. Novel means are used for supporting and positioning a limb so that a predetermined increment of a bone therein can be scanned under repeatable conditions. Scanning is done with a tissue equivalent material surrounding the corresponding portion of the limb so that radiation transmission is substantially uniform through the tissue regions of the scan but has a sharp discontinuity where bone is in the beam.

3,715,588

BONE MINERAL ANALYZER

Frederick A. Rose, Fort Atkinson, Wis., assignor to Norland Corporation, Fort Aktinson, Wis.

Filed Oct. 26, 1970, Ser. No. 83,944
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 S **57 Claims**



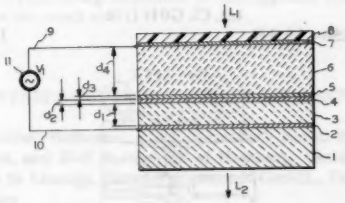
A bone mineral analyzer includes a radioactive photon source and a spaced detector secured to a holder movable along a transverse scanning line. A tissue-covered bone is held in a tissue equivalent cover to produce a constant thickness profile with a photon scanning beam selectively absorbed by the bone and the tissue and tissue equivalent. A dual speed motor moves the holder at a rapid search speed to locate the bone and hold the beam in fixed relation to the tissue and tissue equivalent cover for establishing and storing a tissue reference signal. A slow scan speed is established for scanning the bone and establishing a bone-tissue signal. Corresponding logrithmic signals are subtracted and integrated over the width of the bone to produce a bone mineral related output which drives digital meters. A selection switch interconnects a logic circuitry to permit selection between a pair of bones spaced in a common tissue. Timing circuits improve the characteristic response of the system. Calibration for the digital reader is connected to the output side of the integrator to permit calibration adjustment without disturbing the signal in the integrator.

3,715,589

ELECTROMAGNETIC RADIATION IMAGE DISPLAYING PANEL

Nobumasa Ohoshima, Osakafu; Kinya Himeno, Nara-ken, and Norihiro Tani, Osaka-fu, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Oct. 2, 1970, Ser. No. 77,406
Int. Cl. H01j *1/62*
U.S. Cl. 250—80 **12 Claims**



An image converting panel for displaying a pattern of short wave-length electromagnetic radiations, such as X-rays onto the image converting panel. The panel has a transparent substrate having at least the following layers thereon in the order from the bottom up; an electroluminescent layer having a dielectric constant of 7 to 40 and a thickness of d_1; a reflective layer having a dielectric constant of 10 to 200 and a thickness of d_2; an opaque layer having a specific resistivity of 10^8 to 10^{10}, Ω-cm and a thickness of d_3; a photoconductive layer having a linear relation of dark current to AC electric field up to at least 800 V/mm and a thickness of d_4; an electromagnetic radiation permeable electrode; and a covering layer having a high resistance to humidity. The dimension d_2 is equal to 0.1 to 0.3 d_1; d_3 is equal to 0.1 to 0.3 d_1; and d_4 is equal to 3 to 10 d_1.

3,715,590

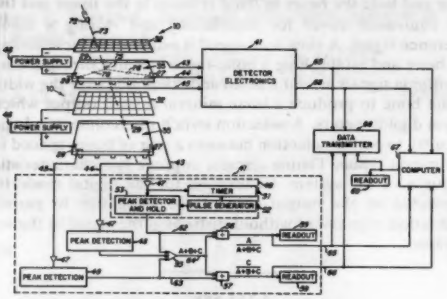
MICROMETEOROID ANALYZER

Siegfried O. Auer, 67 Ludwigshafen-Rhine, Germany, assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed March 26, 1971, Ser. No. 128,419
Int. Cl. G01t *1/00, 1/34*
U.S. Cl. 250—83.3 R **13 Claims**

A system for measuring the direction of flight, velocity, charge, mass and chemical composition of micrometeoroids. The analyzer includes two spaced arrays of interconnected capacitors and an ion detector. Electrodes are fastened to the edge of each array. Micrometeoroids impinge on the arrays

and generate signals at the electrodes. The magnitude of the signals is a function of the impact location. Ions accelerated



from one array are focused on an ion detector to provide a time-of-flight mass spectrometer.

3,715,591

OPTICAL SCANNING EQUIPMENT

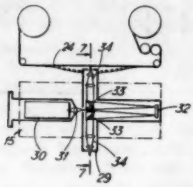
Frank Arthur Gull, St. Albans, England, assignor to Hawker Siddeley Dynamics Limited, Hertfordshire, England

Continuation-in-part of Ser. No. 811,698, March 27, 1969. This application Dec. 3, 1971, Ser. No. 204,463

Claims priority, application Great Britain, April 1, 1968, 5,299/68

Int. Cl. G01t 1/16

U.S. Cl. 250—83.3 H **11 Claims**



An aerial infra-red line-scanning system is provided in which rotation of a scanning rotor not only scans the terrain below the aerial vehicle and reflects the scanning beam on to an infra-red detection cell but also traverses a plurality of recording beams widthwise in succession across a film record transported close to the rotor in a direction parallel to the rotor axis. The recording beams are modulated in accordance with the signal output of the IR cell. The film is constrained, in the region where it is scanned by the recording beams, to a widthwise curvature centered on the axis of the rotor.

3,715,592

THICKNESS CHANGE RADIATION GAUGE

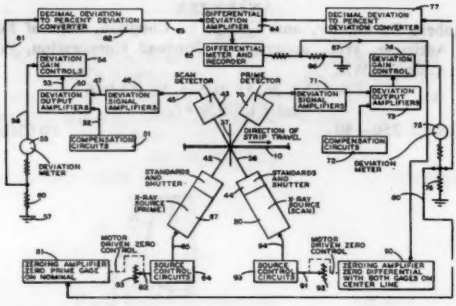
Edward R. Busch, Clarks Summit, and Guy B. Wood, Waverly, both of Pa., assignors to Weston Instruments, Inc., Newark, N.J.

Filed Jan. 12, 1971, Ser. No. 105,886

Int. Cl. G01t 1/16

U.S. Cl. 250—83.3 D **8 Claims**

An illustrative embodiment of the invention shows a technique for accurately observing relative changes in strip thickness during sheet metal rolling operations. This is accomplished by measuring the apparent attenuations of two collimated beams of radiation. The prime radiation beam and the scanning beam, for instance, are tilted in opposite directions relative to the plane of the longitudinally moving metal strip in order to provide clearance for the radiation sources and associated detectors during traverse across the strip width. These tilted beams enable the relative change in strip



thickness to be measured at essentially the same longitudinal position.

3,715,593

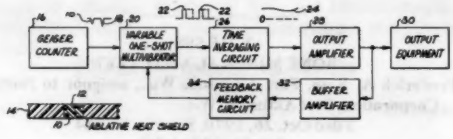
AUTOMATICALLY ADJUSTABLE RADIOACTIVE RADIATION DETECTOR CIRCUIT

Richard D. McGunigle, Fullerton, Calif., assignor to RdF West

Filed March 19, 1970, Ser. No. 23,107

Int. Cl. G01t 1/16, 1/17, 1/18

U.S. Cl. 250—83.6 R **10 Claims**



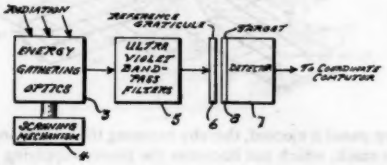
A circuit for measuring short term variations in the average repetition rate of random input pulses, such as from a Geiger counter that monitors the sudden drop in radiation from a test plug containing radioactive wires as the ablative heat shield material is burned away during space vehicle reentry, has a variable one-shot multivibrator that is triggered by each input pulse to generate discrete pulses of selected amplitude and duration. The multivibrator pulses are integrated in a time averaging circuit having a relatively short time constant, compared to duration of the short term variation to be measured, to provide an output signal voltage indicative of the existing input pulse repetition rate. This output signal is delivered through a high gain feedback path having a buffer amplifier and a feedback storage circuit with a relatively long time delay to control a variable impedance element, such as a field effect transistor, in the multivibrator timing circuit to vary the pulse length to compensate for gradual changes in the input pulse rate, such as may result from the slow decline in Geiger counter output rate due to radioactive decay of the material used in the aforementioned test plug wires.

3,715,594

SPACE VEHICLE SYSTEM FOR DETERMINING EARTH'S ULTRAVIOLET RADIATION LIMB

William A. Drohan, Bedford; Juri Valge, Chelmsford, and David A. Warner, Cambridge, all of Mass., assignors to The United States of America as represented by the Secretary of the United States Air Force

Filed Aug. 27, 1969, Ser. No. 853,549
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 UV 1 Claim



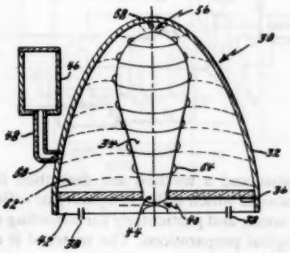
An optical system is used to scan the earth's horizon and project an image from which position information is derived for use in a space vehicle navigation control system. The image is projected onto a camera tube target through ultraviolet filters. The system thus utilizes the earth's ultraviolet radiation limb as an earth-space boundary reference. A radioactive reference graticule is positioned in contiguous relationship with the camera tube target to provide both target intensity calibration and a spatial check of the optical image.

3,715,595

PULSED NEUTRON SORCE

Vernal Josephson, Palos Verdes Estates, Calif., assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed May 11, 9170, Ser. No. 48,762
Int. Cl. G21g 3/04
U.S. Cl. 250—84.5 8 Claims



An apparatus for producing neutrons having a base portion, an energy source and a pair of uniquely designed electrodes, one of which is at least partially of titanium. These electrodes are shaped so as to cause a tri-dimensional compression on the plasma or ionized gas within this apparatus. The tri-dimensional compression in conjunction with the titanium electrode provides for higher temperatures and neutron yields than were heretofore possible.

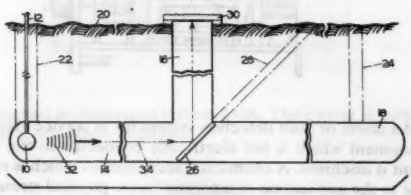
3,715,596

TELLURIAN OPTOEXPLOSIVE SYSTEM INCLUDING NUCLEAR EXPLOSIVE LIGHT GENERATOR AND TARGET IRRADIATION

Jack DeMent, 4847 S.E. Division Street, Portland, Oreg.

Continuation-in-part of Ser. No. 407,461, Oct. 29, 1964, Pat. No. 3,414,838. This application Aug. 7, 1968, Ser. No. 750,979
Int. Cl. G21h 5/03
U.S. Cl. 250—84 25 Claims

This disclosure relates to a tellurian(underground) system(an explotron) for the close-in treatment of an irradiable target by explosion-formed electromagnetic energies characterized as reflectable off a frangible reflective optic such that the target is not overwhelmed by non-reflectable explosion energies like blast and plasma. A typical tellurian explotron is a main duct horizontally sited below the ground, within one end of which is positioned and fired a mass of chemical or nuclear explosive (the optoexplosive) that generates electromagnetic and kinetic energies. Junctured midway or at any other convenient site along the main duct is



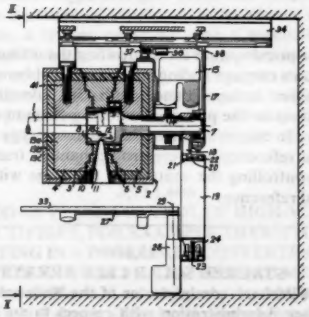
at least one ductoid branch member, which rises to the ground surface and couples with the irradiable target. At the furcation of main duct and branch there is emplaced at a suitable angle a frangible reflective optic such as an aluminum foil mirror which delivers the faster-moving, reflectable radiation via the branch to the target, while the slower-moving, non-reflectable energies transit the main duct and break out the frangible reflective optic, being deposited in the opposite end of the main duct(the shock sink).

3,715,597

ROTATABLE NEUTRON THERAPY IRRADIATING APPARATUS

Ernst-Gunther Hofmann; Klaus Meyerhoff; Bernd Peter Offermann, and Rolf Barthel, all of Hamburg, Germany, assignors to Licentia Patent-Verwaltungs-GmbH., Frankfurt, Germany

Filed Sept. 25, 1970, Ser. No. 75,325
Claims priority, application Germany, Sept. 26, 1969, P 19 48 632.9
Int. Cl. G21f 7/00
U.S. Cl. 250—105 15 Claims

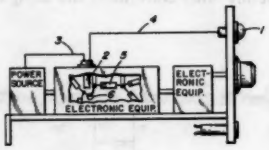


A neutron therapy irradiating apparatus including a neutron source mounted within a collimator. The collimator can be opened by moving its two parts away from one another at a parting plane. The neutron source is accessible from the parting plane, and this moving of the two parts away from one another therefore renders the neutron source accessible from outside the collimator. The parting plane contain mutually interfitting steps, so that when the two parts are in abutment, neutrons cannot leak through the parting plane.

3,715,598
INTEGRAL FAULT DETECTION SYSTEM FOR OPERATING ELECTRONICS EQUIPMENT

Garland L. Tomlin, Jr., 2342 N. Oak Street, Falls Church, Va.

Filed June 12, 1969, Ser. No. 832,565
Int. Cl. G21h *5/02*
U.S. Cl. 250—106 T **8 Claims**

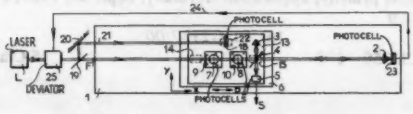


An alarm or fault detection system for in service electronic equipment which is not electrically connected to the equipment is disclosed. A chemical tracer element which is responsive to the application of a certain force, physical stress, electrical stress, or heat, for example, is embedded in the equipment or portion thereof that is to be monitored. When the equipment's functional tolerance limit of the certain force is reached, the tracer element is released in a gaseous form. Presence of the tracer element's vapors in the equipment enclosure is detected by a transducer which responds to a particular vapor representing a particular component or equipment malfunction and indicates it to an observer.

3,715,599
ELECTRO-OPTICAL SYSTEM FOR CONTROLLING THE ATTITUDE OF A STAGE MOUNTED ON A CARRIAGE SLIDING ALONG A PARALLEL BENCH

Raymond Marcy, Paris, France, assignor to Thomson-CSF

Filed April 20, 1971, Ser. No. 135,659
Claims priority, application France, April 21, 1970, 7014414
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 R **8 Claims**



Electro-optical system for controlling the attitude of a stage mounted on a carriage sliding along a parallel bench.

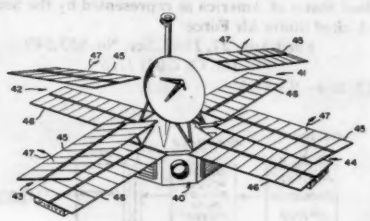
The system in accordance with the invention corrects "yaw" defects on the part of the moving element sliding along the bench. To this end a beam of radiant energy supplies the directional reference and electromechanical transducers are used for controlling the attitude of the stage with respect to this optical reference.

3,715,600
STACKED SOLAR CELL ARRAYS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Jerome M. Weingart, Pasadena, Calif., and Robert K. Yasui, Los Angeles, both of Calif., assignors to the United States of America as represented by the National Aeronautics and Space Administration

Filed Nov. 22, 1971, Ser. No. 200,762
Int. Cl. F64c *39/00*; F03g *7/02*
U.S. Cl. 250—212 **8 Claims**

A solar cell stack, for use in a spacecraft or the like, is disclosed. In the stack only the top solar cell panel is exposed to solar energy to provide electrical power. Except the top panel each panel is covered from exposure to damaging bombarding particles by the preceding panels in the stack toward the stack top. When the exposed top panel's performance is degraded, due to bombardment by particles or other unexpected failure,

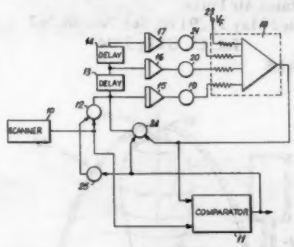


the top panel is ejected, thereby exposing the underlying panel in the stack, which not becomes the power supplying panels. Each panel in the stack is successively exposed when the panel above it is ejected.

3,715,601
APPARATUS FOR DETECTING IRREGULARITIES IN THE LIGHT TRANSMISSION PROPERTIES OF MATERIALS

James Henry Tucker, Cambridge, England, assignor to National Research Development Corporation, London, England

Filed July 8, 1970, Ser. No. 53,139
Claims priority, application Great Britain, July 14, 1969, 35,335/69
Int. Cl. G01n *5/02*
U.S. Cl. 250—222 R **8 Claims**



An apparatus and a method are described for detecting areas of a material which differ in opacity or reflectivity from surrounding areas, and particularly for detecting cell nuclei in stained biological preparations. The material is scanned line by line and the output is applied to a comparator which receives a threshold signal dependent on the opacity or reflectivity of the neighborhood of the area being scanned. The threshold signal is derived by summing the scanner output signal for that part of the line immediately preceding the point being scanned and corresponding parts of adjacent previously scanned lines. Means are provided for holding the threshold signal steady when a cell nucleus is being scanned.

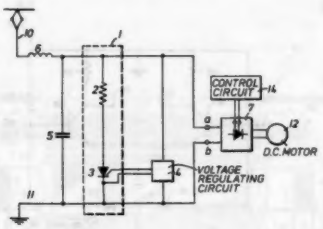
3,715,602
CIRCUIT ARRANGEMENT FOR BRAKING A VEHICLE

Ulrich Putz, Berlin 41, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed March 20, 1972, Ser. No. 236,323
Claims priority, application Germany, March 20, 1971, P 21 14 121.9
Int. Cl. H02g *3/00*
U.S. Cl. 307—9 **13 Claims**

A circuit arrangement for the combined net and resistance braking of an electrically driven vehicle is fed via a pair of lines from a direct current power system. A capacitor is con-

nected across the pair of lines, as is a resistive braking circuit composed of a series arrangement of a braking resistor and a controllable switch. A voltage regulating circuit having its input connected in parallel with the capacitor and its output



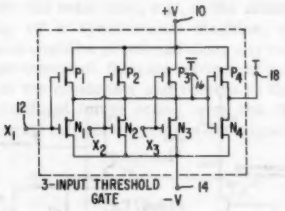
coupled to the control input of the controllable switch is arranged to develop a control signal upon the occurrence of a voltage across the capacitor which exceeds slightly the rated voltage of the pair of lines.

3,715,603

THRESHOLD GATE CIRCUITS EMPLOYING FIELD-EFFECT TRANSISTORS

Joseph B. Lerch, North Brunswick, N.J., assignor to RCA Corporation

Filed Oct. 28, 1971, Ser. No. 193,519
Int. Cl. H03k *19/42*
U.S. Cl. 307—211 **5 Claims**



A threshold gate comprising a plurality of complementary-symmetry, field-effect transistor inverters, each inverter receiving at its common gate connection a different input signal and each connected at its output terminal to a common circuit output terminal. The gate may have inputs all of the same weight or, with appropriately chosen values of transistor conduction channel impedance or parallel connected inverters, may have inputs of different weight.

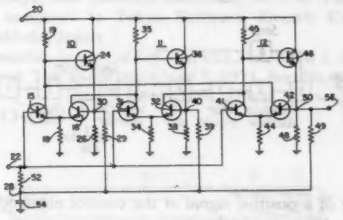
3,715,604

INTEGRATED CIRCUIT FREQUENCY DIVIDER HAVING LOW POWER CONSUMPTION

William Rapshys, Palatine, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 9, 1971, Ser. No. 170,065
Int. Cl. H03k *21/00*
U.S. Cl. 307—220 **5 Claims**

Frequency divider including three stages each including three transistors, with two being connected in a common emitter circuit, and the third connected as an emitter-follower and providing intra-stage coupling. The three stages are connected in a ring-like configuration providing very high frequency, divide by three operation, and is adapted to be



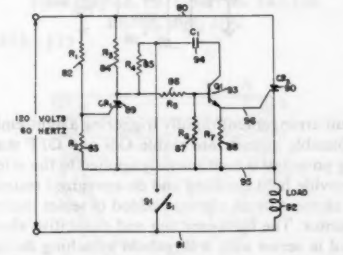
constructed in integrated circuit form. The circuit is suitable for use at low supply voltages.

3,715,605

CONTROL CIRCUIT FOR SINGLE STROKE ELECTRICAL TOOLS

John S. Naber, Route 1, Box 264, Marengo, Ill.

Continuation-in-part of Ser. No. 833,321, June 16, 1969. This application April 12, 1972, Ser. No. 243,299
Int. Cl. H03k *17/00*
U.S. Cl. 307—246 **10 Claims**



A simplified control circuit for a single stroke electrical tool comprises a first triggerable gate connected in series with the tool across a source of supply. A series circuit including a second gate, a trigger capacitor, and a manually actuated switch is then connected between a trigger terminal of the first gate and a current terminal of the first gate or one of the source terminals. A margin of safety against multiple firing is provided by utilizing the voltage drop developed across the load to develop a reverse charge on the trigger capacitor.

3,715,606

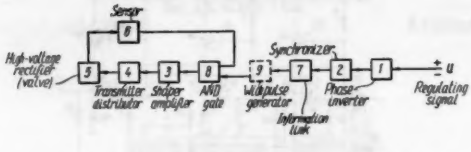
METHOD OF PULSE CONTROL OF HIGH-VOLTAGE RECTIFIERS, FOR EXAMPLE THYRISTORS, OPERATING IN A POLYPHASE CONVERTER, AND A CONTROL SYSTEM TO REALIZE SAID METHOD

Lev Viktorovich Travin, Leninsky prospekt, 101, korpus 136, kv. 125, and Valentin Georgievich Spuv, ulitsa Tukhachevskogo, 28, korpus 1, kv. 49, both of Moscow, U.S.S.R.

Filed Dec. 24, 1970, Ser. No. 101,348
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 Q **5 Claims**

A method and system are characterized in that narrow control pulses are applied to the rectifiers in the presence of a positive voltage across them at the beginning of their conduction interval and at the subsequent passages of the voltage across each rectifier through zero from a negative to a positive value during the entire conduction interval of the rectifier.

The method keeps to a minimum overvoltages in converters operating in the 0-1 mode and completely eliminates the



presence of a positive signal at the control electrodes of the thyristors dangerous to them.

3,715,607

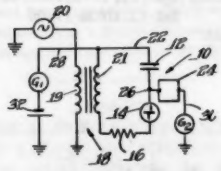
ELECTROLUMINESCENT CIRCUIT OR THE LIKE

Gordon R. Fleming, Pontiac, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 825,153, May 16, 1969. This application March 4, 1971, Ser. No. 120,827

Int. Cl. H03k *3/31*

U.S. Cl. 307—287 **10 Claims**



A circuit arrangement rapidly triggering a light-emitting and control bistable circuit into stable ON and OFF states while operating potential is continuously applied to the selective circuit to provide light emitting and de-energized states. A light-emitting element or an element added in series therewith acts as a capacitor. The light-emitting and capacitive elements are connected in series with a threshold switching device having inherent time delay characteristics, and connected at the circuit juncture between the light-emitting and capacitive elements and the threshold switching device is a start and stop circuit preferably with isolation means for selectively applying start and stop pulses to charge the capacitor while bypassing the threshold switching device to initiate operation of the circuit during one instance, and to discharge the energy stored in the capacitive element to terminate operation of the circuit during another instance. A display array of rows and columns of such bistable circuits is formed with mean for energizing selectively desired start and stop circuits associated with selective bistable circuits independently of the threshold switching devices used in the circuits and for providing means, independent of the operating potential lines, for addressing selected ones of the electroluminescent circuits within an array.

3,715,608

PROGRAMMABLE CIRCUIT AND METHOD

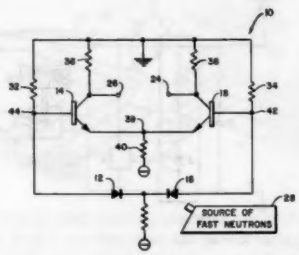
Charles A. Glorioso, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Sept. 23, 1970, Ser. No. 74,668

Int. Cl. H03k *23/22*; **G21h** *5/06*

U.S. Cl. 307—308 **33 Claims**

Specifically, first and second diffused silicon diodes are connected to first and second transistors, respectively, to control the conduction thereof, conduction of the first transistor providing a first output from the circuit and conduction of the second transistor providing a second output from the circuit. One of the diodes is irradiated with fast neutrons to raise its forward voltage drop above that of the other diode. When the first diode is irradiated so that it has a higher forward voltage drop than the second diode, the first transistor is rendered conductive to the exclusion of the conduction of the second



transistor to provide a first output from the circuit in response to an input to the circuit, and vice versa. In general, electrical devices with radiation - alterable parameters are selectively irradiated to program the output of a circuit such as a read-only memory.

3,715,609

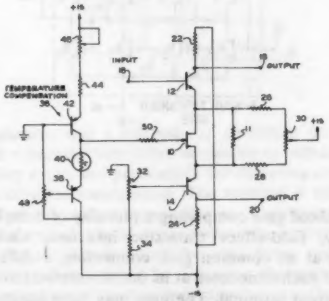
TEMPERATURE COMPENSATION OF VOLTAGE CONTROLLED RESISTOR

Thor Oscar Hallen, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 17, 1971, Ser. No. 172,466

Int. Cl. H03k *3/26*

U.S. Cl. 307—310 **7 Claims**



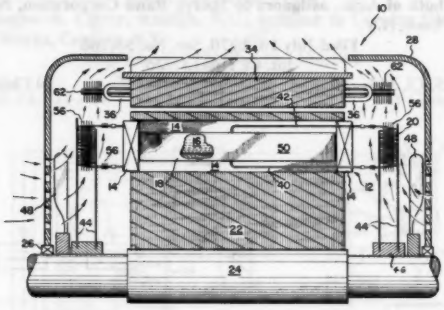
A voltage controlled resistor of the junction gate field effect type is temperature compensated by a circuit including the emitter-base junction of a bipolar transistor and also a temperature responsive resistor having a temperature sensitivity which is substantially the same as that of the channel of the voltage controlled resistor. The temperature responsive resistor and the bipolar transistor are subjected to substantially the same temperature conditions as the voltage variable resistor and the voltage responsive resistor and emitter-base junction of the bipolar transistor are connected in series with a current source. The voltage drops across such emitter-base junction and voltage responsive resistor vary with such temperature and are employed as parts of a reverse-bias potential applied between the gate and channel of the voltage controlled resistor.

3,715,610

DYNAMOELECTRIC MACHINE COOLED BY A ROTATING HEAT PIPE

William Guy Brinkman, Schenectady, N.Y., assignor to General Electric Company

Filed March 7, 1972, Ser. No. 232,385
Int. Cl. H02k 9/20
U.S. Cl. 310—54 8 Claims



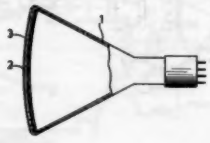
A dynamoelectric machine is described wherein heat generated within the rotor is removed utilizing a heat pipe rotating about the rotor shaft. Heat is absorbed from the rotor by vaporization of a portion of the refrigerant within a rectangular evaporator juxtaposed with the heat generating region of the rotor whereafter the vaporized refrigerant flows radially inward (due to centrifugal forces acting upon the higher density liquid refrigerant) to pass to a condenser coil secured to the rotor at a relatively cool location. Upon cooling to a liquid state in the condenser, the liquid refrigerant is forced radially outward along the condenser coil to return to the evaporator through a radially outer orifice. Preferably, the evaporator is situated within the rotor coils, e.g., at the center of the field pole winding of a synchronous machine, although the evaporator also could be positioned along any radially extending side of the rotor coil. Because refrigerant passes from the evaporator to the condenser and returns to the evaporator solely by centrifugal forces acting upon the closed cooling system, a separate refrigerant pump is not required to cool the motor.

3,715,611

CATHODE-RAY TUBE CONTAINING CERIUM ACTIVATED YTTRIUM SILICATE PHOSPHOR

Albert Hijman Gomes De Mesquita, and Alfred Bril, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 7, 1969, Ser. No. 848,179
Claims priority, application Netherlands, Aug. 9, 1968, 6811326
Int. Cl. C09k 1/54; H01j 29/20
U.S. Cl. 313—92 PH 8 Claims



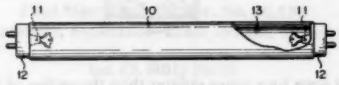
A flying-spot scanner or a color television tube having indexing strips comprises a luminescent screen or indexing strips of a substantially non-persistent luminescing material consisting of yttrium silicate activated by trivalent cerium.

3,715,612

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP RADIATING GERMICIDAL AND ERYTHEMAL RAYS IN RATIO OF LESS THAN 1.5

Akira Someya, and Kohtaro Kohmoto, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Continuation-in-part of Ser. No. 812,264, April 1, 1969, abandoned. This application June 3, 1971, Ser. No. 149,437
Int. Cl. H01j 61/30, 61/44
U.S. Cl. 313—109 2 Claims



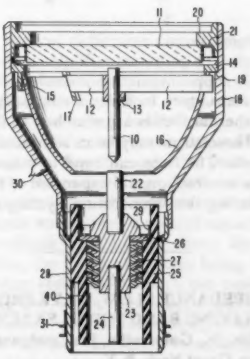
A low pressure mercury vapor discharge lamp emitting erythemal rays and germicidal rays includes an envelope on the inner surface of which there is coated with an erythemal ray emitting film for transmitting to the outside of said envelope visible straight light beams within the range of 45 to 75 percent.

3,715,613

SEALED HIGH-PRESSURE ARC LAMP AND SOCKET THEREFOR

Malcolm F. Parkman, Foster City, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed May 13, 1971, Ser. No. 143,166
Int. Cl. H01j 1/92
U.S. Cl. 313—113 6 Claims



A sealed beam arc lamp is disclosed wherein the lamp exterior is at a single electrical potential. The non-window portion of the lamp exterior can be of high strength metal alloy. Electrical insulation is provided by a thermally conductive ceramic cylinder internal to the lamp and disposed so as to avoid tensile stresses, and by a sealed labyrinthine passage defined by a removable socket.

3,715,614

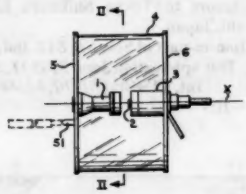
THREE ELECTRODE SPARK GAP APPARATUS

Irving E. Linkroum, Hancock, N.Y., assignor to The Bendix Corporation

Filed Sept. 28, 1971, Ser. No. 184,381
Int. Cl. H01j 17/30
U.S. Cl. 313—183 44 Claims

A three electrode spark gap apparatus wherein three electrodes are arranged along the same axis with two of the elec-

trodes concentrically arranged. The electrodes and the enclosure which houses the electrodes are generally cylindrical shaped and are dimensioned so that the radius of the enclo-



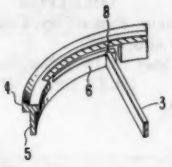
sure is at least four times greater than the radius of the largest electrode located within the enclosure to prevent damage to the enclosure from the arc between electrodes.

3,715,615

ELECTRODE SUPPORT FOR ARC LAMPS

Gordon R. Lavering, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed May 14, 1971, Ser. No. 143,377
Int. Cl. H01j *1/96, 19/50*
U.S. Cl. 313—204 **11 Claims**



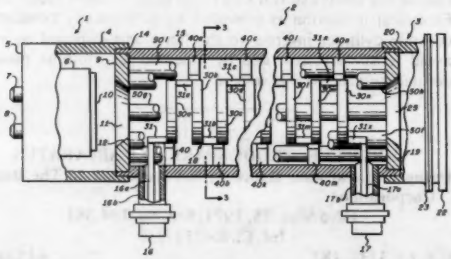
An electrode support structure is disclosed for use in a short arc lamp. The structure includes a ring having a plurality of flaps formed therein. Struts are attached to the electrode and to the flaps. These struts may be straight and may be abutted to the electrode. The flaps can bend to minimize the stresses created by the contraction and expansion of the struts relative to the ring during the temperature cycling of assembly and operation.

3,715,616

HIGH-IMPEDANCE SLOW-WAVE PROPAGATION CIRCUIT HAVING BAND WIDTH EXTENSION MEANS

Thomas B. Elfe, Jr., Gainesville, Fla., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Oct. 12, 1971, Ser. No. 188,401
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **5 Claims**



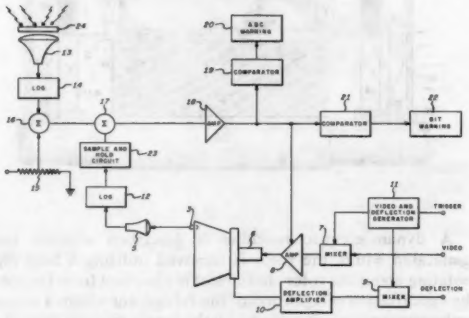
A slow traveling wave bar and ring high frequency transmission line energy propagation structure for traveling wave tubes is supported by a novel electrically isolating, thermally conducting array of support elements coaxially within a shell having spaced longitudinally extending conductivity perturbations.

3,715,617

OPTICAL PROBE FOR CATHODE RAY TUBES

Homer B. Tilton, Tucson, and Jack W. Blanchard, Phoenix, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 10, 1970, Ser. No. 53,766
Int. Cl. H01j *31/26*
U.S. Cl. 315—10 **14 Claims**



A fiber optics probe, embedded in the faceplate of a cathode ray tube, samples the light emitted from the cathode ray tube phosphor coating. The sampled light is sensed and provides an equivalent electrical signal. The magnitude of the signal is compared with a signal proportional to the ambient light and the resultant signal is utilized to effect an automatic brightness control function. The resultant signal may also be used to effect a built-in test of the cathode ray tube drive and display circuits

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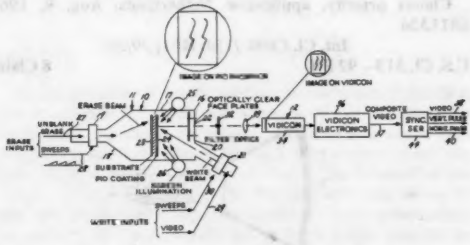
3,715,618

VIDICON VIEWED STORAGE TUBE IN WHICH THE NEWEST LINE OF INFORMATION IS DISPLAYED ON THE UPPERMOST PORTION OF THE TUBE

Alfred I. Paley, Wantagh; Leonard Newman, White Plains, both of N.Y.; Peter Seats, Boonton, and Bernard M. Waxenbaum, Paramus, both of N.J., assignors to Loral Corporation, Bronx, N.Y. and Thomas Electronics, Inc., Wayne, N.J.

Filed March 5, 1969, Ser. No. 804,483
Int. Cl. H01j *31/26*
U.S. Cl. 315—10 **2 Claims**



A vidicon viewed storage tube device, in which information is continuously displayed on a dark trace direct view storage tube. The tube contains a first or writing electronic gun, and a second or erase gun which removes the trace by heat impinging upon activated portions of the tube phosphor coating. A

vidicon scans the storage tube in such manner that the newest line of information on the storage tube is displayed at the upper most portion of the vidicon display to provide a "-passing scene" or "moving window" type of display.

3,715,619

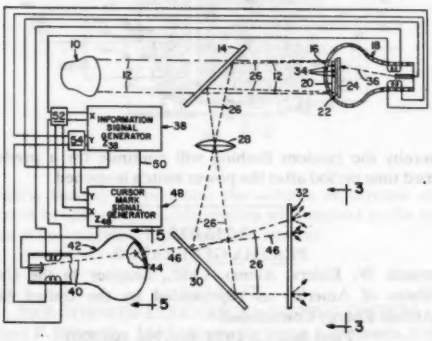
STORAGE CATHODE RAY TUBE ELECTRON BEAM POSITION INDICATOR

Douglas A. Cotter, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 6, 1971, Ser. No. 104,244

Int. Cl. H01j *31/26*

U.S. Cl. 315—10 **19 Claims**



Apparatus to display a cursor mark image which indicates the electron beam position of a storage cathode ray tube without storing the cursor mark image along with information desired to be stored. To generate the non-storing cursor mark image this apparatus uses a second cathode ray tube, the electron beam of which is deflected substantially in parallel with the electron beam of the storage cathode ray tube. The cursor mark image produced by the second cathode ray tube and the information image produced by the storage cathode ray tube are then optically aligned and simultaneously displayed on a viewing screen.

3,715,620

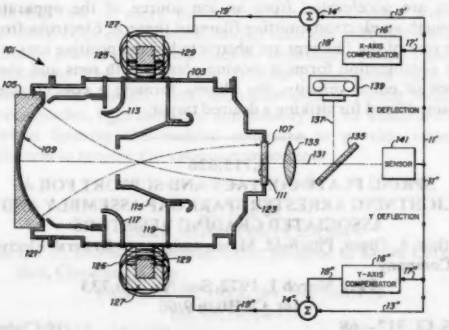
COMPENSATION DEVICE FOR NON-LINEAR ELECTROMAGNETIC SYSTEMS

Dominic P. Marro, Chelmsford, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Sept. 15, 1970, Ser. No. 72,472

Int. Cl. H01j *29/76, 29/70*

U.S. Cl. 315—27 **11 Claims**



Apparatus is disclosed which compensates for non-linear responses of electromagnetic systems which apparatus includes a hysteresis simulator. The simulator samples an input signal to the system and produces an output signal which when combined with the original input effects a linear response of the electromagnetic system with respect to the original input signal.

3,715,621

TRANSISTOR DEFLECTION CIRCUITS UTILIZING A CLASS B, PUSH-PULL OUTPUT STAGE

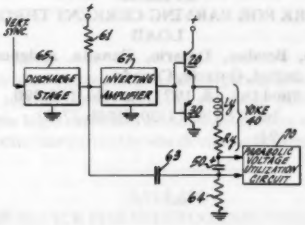
George Schiess, Stallikon, Switzerland, assignor to RCA Corporation

Filed March 3, 1970, Ser. No. 16,130

Claims priority, application Great Britain, March 3, 1969, 11,212/69

Int. Cl. H01j *29/70*

U.S. Cl. 315—27 TD **10 Claims**



Transistorized vertical deflection circuit employs a multi-stage deflection wave amplifier including an output stage of a Class B, push-pull, complementary-symmetry type, with vertical yoke windings driven by output stage emitters. Ground return for vertical yoke windings is effected via path including electrolytic capacitor and current sampling resistor, with the capacitor blocking the flow through the yoke windings of direct current from the output stage. Deflection circuit employs Miller Integrator approach to sawtooth wave generation, developing sawtooth wave across a second capacitor included in a negative feedback path looped about the multi-stage deflection amplifier, the feedback voltage being derived from the current sampling resistor. Feedback use enables employment of relatively low-valued electrolytic capacitor for the D.C. blocking function without introducing undesired distortion of deflection current waveform. Vertical rate parabolic voltage developed across low-valued electrolytic capacitor is of adequate magnitude to serve as input waveform for vertical dynamic convergence circuits. In one embodiment, electrolytic capacitor serves as parabola source for additional feedback to Miller Integrator input in order to effect S-shaping of deflection wave.

3,715,622

METAL-HALIDE DISCHARGE LAMPS

Robert Brian Page, and Thomas William Cartwright, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Filed May 11, 1971, Ser. No. 142,313

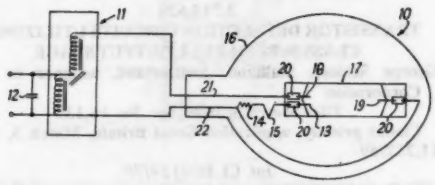
Claims priority, application Great Britain, June 26, 1970, 31,200/70

Int. Cl. H01j *7/30, 17/30*

U.S. Cl. 315—60 **15 Claims**

A metal-iodide discharge lamp with two main and one auxiliary electrodes mounted in a quartz discharge tube. Deterioration of the quartz between the metal-to-quartz seals of the auxiliary electrode and the adjacent main electrode is substan-

tially prevented by a thermal switch which keeps the auxiliary electrode disconnected from the remote main clectrode while



the discharge tube is running at its normal operating temperature.

3,715,623

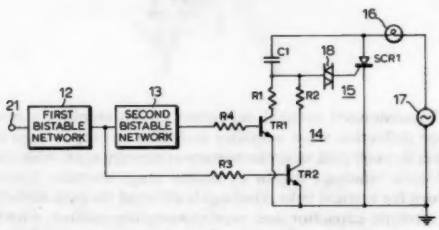
NETWORK FOR VARYING CURRENT THROUGH A LOAD

John Szabo, Breslau, Ontario, Canada, assignor to Electrohome Limited, Ontario, Canada

Filed Oct. 18, 1971, Ser. No. 189,890

Int. Cl. G05f *1/00;* **H05b** *37/02*

U.S. Cl. 315—194 **10 Claims**



A sensing device controls an input pulse generator that is connected to the input terminal of one of at least two cascaded bistable devices. The output signals of the bistable devices are decoded and the resultant signal is used in a control circuit for controlling the amount of current flowing in a load dependent upon the decoder signal.

3,715,624

ELECTRONIC CHANCE CIRCUIT

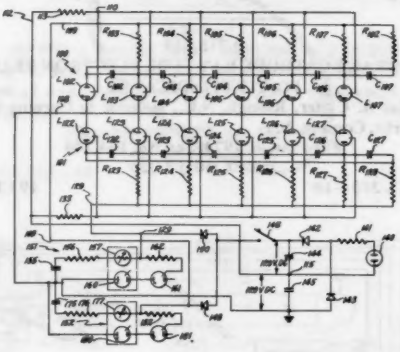
Fred W. Herman, 3513 N. San Miguel, Tampa, Fla.

Continuation of Ser. No. 782,976, Dec. 11, 1968, abandoned. This application Feb. 19, 1971, Ser. No. 117,049

Int. Cl. H05b *37/02*

U.S. Cl. 315—209 **4 Claims**

A random pattern generator having a plurality of neon indicator lamps which flash in random or pseudo-random sequence for use in electronic games of chance, probability studies or other desired applications. Each neon lamp is connected in series with a resistor to form one of a plurality of identical circuit branches connected in parallel across a switch controlled power source. The neon lamp-resistor junctions of the plurality of circuit branches are connected in a ring configuration by means of a like number of commutating capacitors. When the power switch is closed the neon lamps are energized to breakdown voltage and flash in a random sequence determined by momentary circuit instabilities. A holding circuit is provided to maintain conduction through the neon lamp which is on at the time the power switch is opened. A time delay circuit is incorporated into the holding circuit



whereby the random flashing will continue for a predetermined time period after the power switch is opened.

3,715,625

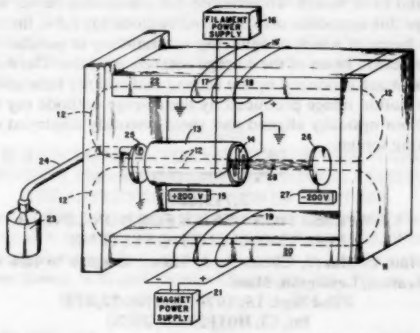
PLASMA GENERATOR

Kenneth W. Ehlers, Alamo, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 12, 1971, Ser. No. 105,880

Int. Cl. H01j *1/20*

U.S. Cl. 317—4 **7 Claims**



An apparatus for generation of dense ion-electron plasma. Ions are accelerated from an ion source of the apparatus through an electron emitting filament thereof. Electrons from the rear of the filament are abstracted to the positive ions and the combination forms a moving plasma with ions and electrons of equal velocity, the plasma forming a concentrated beam utilized for striking a desired target.

3,715,626

SPRING PLATE CONTACT AND SUPPORT FOR A LIGHTNING ARRESTER SPARKGAP ASSEMBLY AND ASSOCIATED GRADING RESISTORS

Arthur A. Olsen, Pittsfield, Mass., assignor to General Electric Company

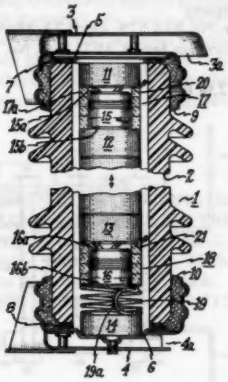
Filed March 1, 1972, Ser. No. 230,733

Int. Cl. H02h *9/06*

U.S. Cl. 317—68 **10 Claims**

A lightning arrester having a self-supporting column of sparkgap assemblies and non-linear resistor valve elements, as well as a plurality of load-bearing grading resistors, is provided

with a spring plate that is effective to form part of the series discharge circuit through the arrester while at the same time affording a resilient support for the column of arrester components, thereby to maintain the column of arrester components in spaced-apart relationship with respect to the inner walls of the insulating housing of the arrester.



3,715,627

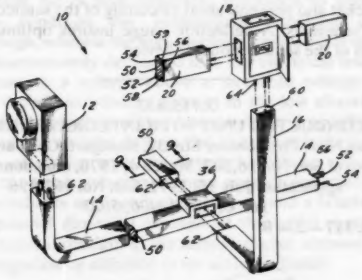
PRE-FORMED ELECTRICAL WIRING SYSTEM

Robert F. D'Ausilio, 16354 Grayville Drive, La Mirada, Calif.

Filed May 13, 1971, Ser. No. 142,949

Int. Cl. H02b 1/08

U.S. Cl. 317—99 **6 Claims**



An electrical wiring system which includes a pre-formed, conductive, main trunk line and a plurality of off-shoot lines having two or more conductive wires embedded within a molded body of insulation, and at least one soft metal wire to enable pre-forming of the lines for installation within a molded structure. The system also includes components such as a main circuit-breaker box, individual plug-in circuit breakers, receptacles, light switches, and dummy blocks which are used when forming the molded structure to provide openings therein to receive the various components.

3,715,628

CARD MOUNTING CHASSIS

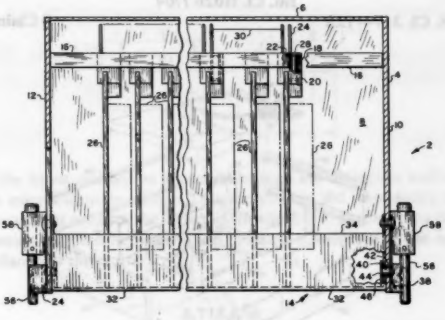
Arlyn G. Liddell, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed July 26, 1971, Ser. No. 166,172

Int. Cl. H02b 1/02

U.S. Cl. 317—101 DH **5 Claims**

Means for mounting logic cards on a device to be controlled thereby comprising a housing having a connector bar mounted therein for releasably receiving a plurality of logic cards and having all inter-card connections made internally of the housing, the housing being releasably securable to the device to be controlled, and having a connector bar carried by the device to be controlled connectable to the logic cards while the logic cards are retained in the housing, and having all connections between the logic cards and external equipment made through the connector bar carried by the device to be controlled.



3,715,629

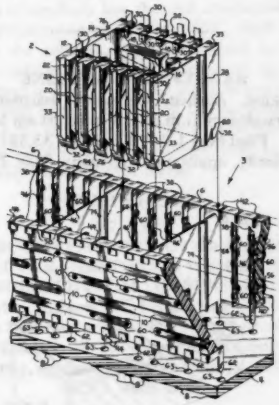
WIRING DEVICE FOR INTERCONNECTING MODULE CIRCUIT UNITS

Robert Charles Swengel, Sr., Hellam, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 848,568, Oct. 26, 1959, abandoned. This application April 5, 1967, Ser. No. 629,868

Int. Cl. H02b 9/00

U.S. Cl. 317—101 R **17 Claims**



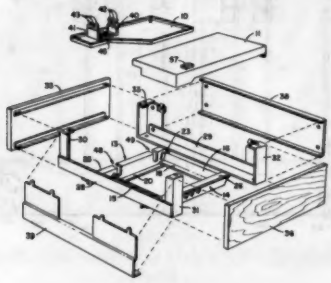
This invention relates to a modular system and its components, and more particularly to a system wherein the functional circuit cells or circuit modules are pluggable elements in a framework providing essentially three dimensions for the intermodule wiring. The framework includes sidewall panels having printed circuitry strips on one side thereof and electrical contacts of the other side thereof, the contacts being selectively connected to the printed circuitry strips according to a predetermined pattern.

3,715,630

ELECTRONIC CHASSIS FRAME ASSEMBLY WITH CABLING FOR PRINTED CIRCUIT BOARDS

Virgil F. Kuhl, Addison, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed March 26, 1971, Ser. No. 128,451
Int. Cl. H02b *1/04*
U.S. Cl. 317—122 8 Claims



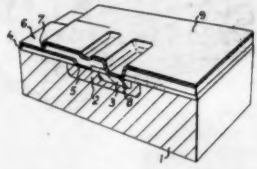
A frame assembly for supporting an electronic chassis includes a main frame having spaced apart side members and spaced apart end members forming a rectangularly shaped base having an open top and bottom. A second portion of the frame assembly includes a second open rectangle which is greater in at least one dimension than the first rectangle and is mounted on the main frame. Cable guiding cutouts are provided on one of the side members of the main frame and connector apertures are formed on the other side member of the main frame to facilitate the guiding and interconnection of cables extending below an electronic chassis supported by the second portion of the frame assembly. In addition a circuit board holding member facilitates mounting and holding circuit boards on the chassis in substantially perpendicular relationship to it.

3,715,631

RADIO-FREQUENCY LINE

Heinz Beneking, Aachen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 1, 1970, Ser. No. 33,581
Claims priority, application Germany, May 27, 1969, P 19 26 989.7
Int. Cl. H01l *5/06*
U.S. Cl. 317—234 R 12 Claims



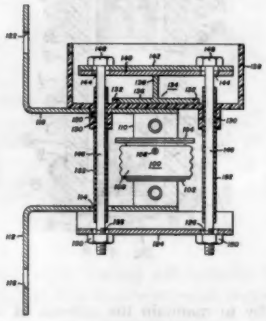
A radio-frequency line suitable for use as an electrical supply lead to semiconductor components, comprising a semiconductor body containing at least one semiconductor component and a strip line comprising a supply lead and a sink which is provided on one surface of the semiconductor body, a dielectric layer being provided between the supply lead and the sink.

3,715,632

LIQUID COOLED SEMICONDUCTOR DEVICE CLAMPING ASSEMBLY

William Warburton, Skaneateles, N.Y., assignor to General Electric Company

Division of Ser. No. 818,578, April 23, 1969, abandoned. This application Jan. 8, 1971, Ser. No. 105,014
Int. Cl. H01l *1/12*
U.S. Cl. 317—234 R 3 Claims



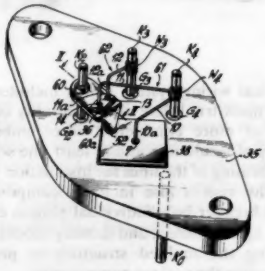
A semiconductor device adapted to be mounted with compression applied to the major current carrying terminals is assembled with coolant units mounted adjacent opposite ends. The coolant units include a central core of highly electrically and thermally conductive material cooperating with a shell to define a coolant passage therethrough. The coolant units and semiconductor device are compressively associated by bolts cooperating with a fulcrum mounted deflectable plate. An insulative casing positions the bolts, the fulcrum, and a mounting bracket and prevents short circuiting of the semiconductor device terminals. A deflection gauge insures optimum compression of the semi-conductor device.

3,715,633

SEMICONDUCTOR UNIT WITH INTEGRATED CIRCUIT

Johannes Nier, Pirmasenser Str. 32, Stuttgart, Germany

Division of Ser. No. 16,303, March 4, 1970, abandoned. This application July 15, 1971, Ser. No. 162,996
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R 7 Claims



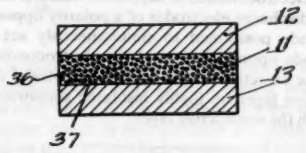
A semiconductor element. A first semiconductor body has a pair of first major surfaces on opposite sides. A first contact is provided on and covers one of the first surfaces. A socket plate is conductively connected to the other of the first surfaces and has a first contact pin. A second semiconductor body has a pair of second major surfaces and a second contact provided on and covering one of these second major surfaces. A carrier is connected with the socket plate and the second semiconductor body and located between the two. A second contact pin is provided on the second body at a side thereof

facing away from the carrier and a third contact pin is provided, both the second and third contact pins penetrating the socket in insulated relationship. A connecting wire has a straight first end portion conductively secured to the second contact pin, a helically convoluted second portion conductively secured to the third contact pin, and a center portion with respect to which each of the end portions extends at an angle. An additional contact pin is provided on the first semiconductor body at a side thereof facing away from the socket plate and is in direct electrically conductive engagement with the carrier.

3,715,634
SWITCHABLE CURRENT CONTROLLING DEVICE WITH INACTIVE MATERIAL DISPERSED IN THE ACTIVE SEMICONDUCTOR MATERIAL

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed July 5, 1968, Ser. No. 742,717
Int. Cl. H01l 9/00
U.S. Cl. 317—234 R **11 Claims**

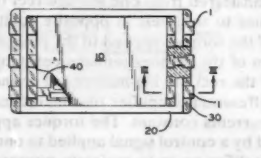


A switchable controlling device for an electrical circuit including a semiconductor element and electrodes in low electrical resistance contact therewith, wherein said semiconductor element has a high electrical resistance to provide a blocking condition for substantially blocking current therethrough, wherein the high electrical resistance is substantially instantaneously decreased to a low electrical resistance in response to a voltage above a threshold voltage value, wherein the semiconductor element in the low electrical resistance conducting condition has a voltage drop which is a fraction of the voltage drop in the high electrical resistance blocking condition near the threshold voltage value, and wherein the semiconductor element consists essentially of an active switchable semiconductor material and a relatively inactive material dispersed throughout the active material to add mechanical strength to the semiconductor element and to inhibit migration or diffusion in the active material.

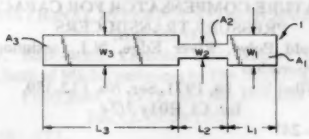
3,715,635
HIGH FREQUENCY MATCHED IMPEDANCE MICROCIRCUIT HOLDER

Donald E. Michel, Sidney, and Richard R. Komatinsky, Upton, both of N.Y., assignors to The Bendix Corporation

Filed June 25, 1971, Ser. No. 156,641
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R **13 Claims**



A high frequency (greater than 10^8 hertz) microcircuit holder having a predetermined characteristic impedance that matches the impedance of the incoming transmission lines. The package is designed to achieve maximum power and/or signal transfer to a microcircuit hermetically sealed in the package. The characteristic impedance of the holder is reduced by a predetermined capacitance established between an input contact and a metal base plate. The impedance of the input contact is increased by reducing the cross-sectional area

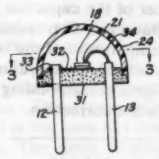


of the input contact as it passes through the dielectric wall of the microcircuit package. This increase in the impedance of the contact reduces the effect of the dielectric surrounding the contact which otherwise would result in a decrease in the impedance of the contact.

3,715,636
SILICON CARBIDE LAMP MOUNTED ON A CERAMIC OF POOR THERMAL CONDUCTIVITY

Mary S. Jaffe, Cleveland Heights, and Ralph M. Potter, Pepper Pike, both of Ohio, assignors to General Electric Company

Filed Jan. 3, 1972, Ser. No. 215,069
Int. Cl. H01l 15/00, 1/02, 1/10
U.S. Cl. 317—234 R **16 Claims**

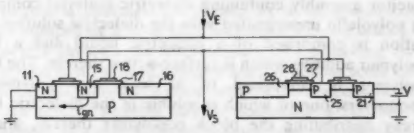


A boron-doped silicon carbide light-emitting diode chip is mounted, such as on a support member of porous ceramic or other material of similarly low thermal conductivity, so as to operate at a temperature of at least 150°C. Such a construction increases the amount of light produced by the boron-doped silicon carbide diode, due to increased operating temperature. A cover is placed over the diode to prevent convection cooling, thus further increasing the operating temperature and hence the light output. Instead of boron doping, the silicon carbide diode can be doped with other materials that produce similarly deep acceptor levels.

3,715,637
LOGIC CIRCUITS EMPLOYING COMPLEMENTARY FIELD-EFFECT TRANSISTORS IN WHICH THE GATE IS INSULATED FROM THE SUBSTRATE

Raymond Poirier, 75 Paris 101, France, assignor to Societe Europeenne de Semiconducteurs et de Miroelectronique

Filed Dec. 30, 1971, Ser. No. 214,002
Claims priority, application France, Jan. 12, 1971, 7100772
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R **3 Claims**



An inverter employing complementary MOS transistors, insensitive to light radiation, comprises in each transistor, a dif-

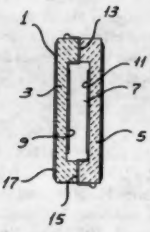
fused zone of opposite conductivity type to that of the substrate this diffused zone being connected by a conduction channel to the corresponding drain, when the transistor is driven conductive.

3,715,638

TEMPERATURE COMPENSATOR FOR CAPACITIVE PRESSURE TRANSDUCERS

William Ronald Polye, River Edge, N.J., assignor to The Bendix Corporation

Filed May 10, 1971, Ser. No. 112,359
Int. Cl. H01y *3/24*
U.S. Cl. 317—247 **8 Claims**



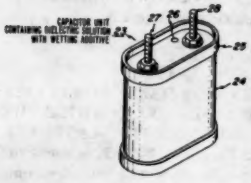
A pressure transducer of the capacitor type having a body of dielectric material has a thin film resistor deposited on the body for sensing the temperature of the body. The resistor is of a material having a suitable temperature coefficient of resistivity to provide a signal corresponding to the temperature of the body for temperature correction.

3,715,639

ELECTRICAL APPARATUS CONTAINING DIELECTRIC SOLUTION

George L. Gaines, Scotia, and Donald G. LeGrand, Burnt Hills, both of N.Y., assignors to General Electric Company

Division of Ser. No. 839,642, July 7, 1969. This application Feb. 16, 1972, Ser. No. 226,948
Int. Cl. H01g *3/04*
U.S. Cl. 317—258 **6 Claims**



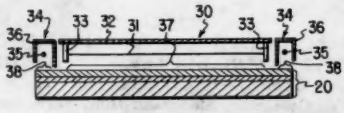
An electrical apparatus containing a dielectric solution with good wetting properties is disclosed as well as an electrical capacitor assembly containing dielectric material comprised of a polyolefin impregnated with the dielectric solution. The solution is comprised of a dielectric liquid and a block copolymer additive which is surface-active therein. The block copolymer is comprised of at least two polymerized comonomers, one of which is soluble in the dielectric liquid thereby distributing the block copolymer therein, and the second of which is sufficiently surface-active in the solution to produce a solution having a surface tension less than that of the dielectric liquid alone.

3,715,640

CORONA CHARGING PROCESS AND APPARATUS IN ELECTROPHOTOGRAPHY

Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed April 14, 1971, Ser. No. 133,787
Int. Cl. G03g *15/02*
U.S. Cl. 317—262 A **10 Claims**



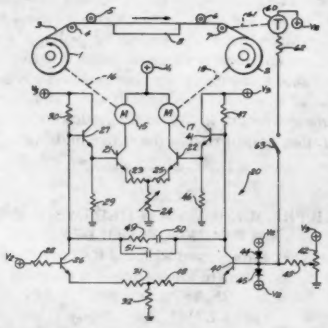
The method of corona charging comprising a main corona discharging electrode positioned to act upon an insulating layer on an electroconductive supporter which is not earthed, and corona discharge electrodes of a polarity opposite to said main electrode positioned to simultaneously act with said main electrode upon a portion of the electroconductive supporter. In the structure of photographic material comprising the conductive layer on highly insulated supporter, it is difficult to earth the conductive layer.

3,715,641

FILM SUPPORT SYSTEM

Lyle T. Mattes, Torrance, Calif., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Sept. 21, 1970, Ser. No. 74,059
Int. Cl. B65h *77/00*
U.S. Cl. 318—7 **19 Claims**



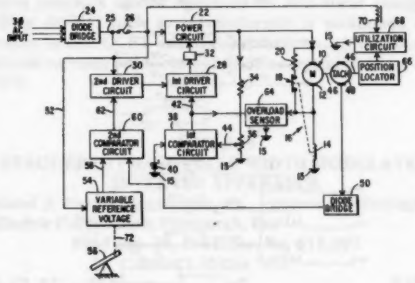
Film is transferred from one storage reel to another by applying torques to the reels in opposite rotational directions. The ratio of the torques applied to the reels is adjustable such that the sum of the torques remains constant. The excitation windings of the reel driving motors are connected to the outputs of a differential amplifier that maintains the sum of the excitation currents constant. The torques applied to the reels are adjusted by a control signal applied to one input of the differential amplifier so as to maintain approximately constant film transport speed. The control signal is representative of the deviation of the sum of the angular velocities of the reels from an adjustable constant value.

3,715,642

DC CONTROL CIRCUITS FOR DIRECT DRIVE MOTORS CONTINUOUSLY COUPLED TO SEWING MACHINES FOR CONTROLLING SEWING FUNCTIONS

Heinz E. Walter, Blankenloch, Buchig, Germany, assignor to The Singer Company, New York, N.Y.

Filed June 21, 1971, Ser. No. 155,082
Int. Cl. H02p 3/12
U.S. Cl. 318—269 13 Claims



A circuit is disclosed for controlling DC direct drive motors which are continuously coupled to a sewing machine drive shaft. A variable DC reference voltage is supplied by a foot pedal controller which in turn controls the output voltage of the power drive transistors which are coupled to the DC direct drive motor. A tachometer coupled to the motor shaft generates a feedback voltage which subtracts from the variable reference voltage, effectively reducing the reference voltage to maintain a constant motor speed. The maximum voltage and current applied to the motor is controlled at all times by a second feedback loop.

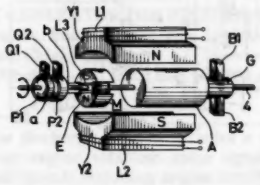
Automatic positioned stopping responsive to input commands is accomplished by a solenoid-actuated mechanical brake which is energized for a predetermined time by a special utilization circuit comprising a transistor which is turned on for a limited period determined by a capacitor discharge initiated by a position sensor pulse enabled by the input command. The drive circuits are disabled for the braking period to permit all mechanical actuation to cease before the machine can be restarted.

3,715,643

ELECTRICALLY DRIVEN MOTOR

Kazumi Masaki, Toyonaka-shi, Osaka-fu, Japan, assignor to Yamato Mishin Seizo Kabushiki Kaisha, Osaka-fu, Japan

Filed March 24, 1971, Ser. No. 127,545
Claims priority, application Japan, April 2, 1970, 45/28391; March 31, 1970, 45/27320; Oct. 9, 1970, 45/88994; Dec. 9, 1970, 45/109096
Int. Cl. H02p 3/02
U.S. Cl. 318—466 4 Claims



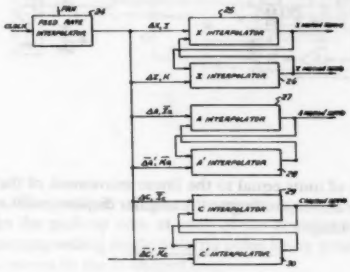
An electrically driven motor that can be rapidly rotated and stopped at a predetermined position about its own axis of rotation. To this end, the motor is provided with a rotational shaft rigidly mounted with a rotary magnet in coaxial relation to the rotor, said rotary magnet being adapted to be magnetized in one predetermined direction to produce a a magnetic force acting on the rotor so as to stop said rotor at a predetermined position about its own axis of rotation.

3,715,644

PROPORTIONAL INTERPOLATOR IN MULTIAXIS MACHINES

Vincent F. Bobrowicz, Livonia, and Hubert B. Henegar, Detroit, both of Mich., assignors to The Bendix Corporation

Filed June 2, 1971, Ser. No. 149,266
Int. Cl. G05b 19/24
U.S. Cl. 318—573 17 Claims



A system for causing proportional interpolation in a numerically controlled machine having three, or more, degrees of motion is described. Two of the degrees of motion may occur in a plane defined by perpendicular axes and can be planar or revolutional motions. These two motions would then be defined with respect to the axes and could be mathematically linear or nonlinear. The other degrees of motion can be revolutional or planar motions individually defined with respect to any of the axes of the system. The invention is directed to a system for causing all motions to be proportional to a selected one of the motions irrespective of whether the selected motion is linear or nonlinear. This is achieved by calculating proportionalities between the selected motion and the other motions and combining the calculated proportionalities with the programmed data to cause the final motion to be in accordance with the combined data.

3,715,645

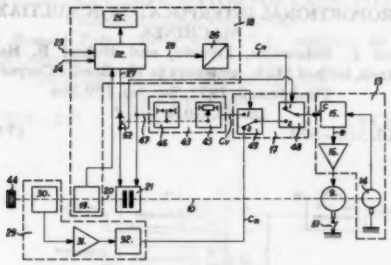
HIGH PRECISION READING DEVICE OF THE GRADUATIONS OF A PRECISION RULER

Robert Viret, and Jacques Pettavel, both of Geneva, Switzerland, assignors to Societe Genevoise D'Instruments de Physique, Geneva, Switzerland

Filed Aug. 2, 1971, Ser. No. 168,210
Claims priority, application Switzerland, Sept. 2, 1970, 13079/70
Int. Cl. G05b 19/28
U.S. Cl. 318—603 4 Claims

The invention concerns a measuring machine comprising a supporting stand carrying a mobile member which can be moved relative to this supporting stand in at least one direction, and a motor fitted with its servo-control device, for driving this mobile member in its movements. The servo-control device is operated alternately by a numerical control device comprising a reversible counter and by an analog control device through the intermediary of a switching device. The analog control device comprises a precision scale carried by the mobile member, a photo-electric microscope furnished with an optical sighting device possessing a rotating field diaphragm, movable between positions corresponding to portions of the measuring field centered on two different marks of the graduation of the precision scale. An impulse generator is

angularly rigidly connected to the field diaphragm and delivers control signals for the reversible counter causing the algebraic subtraction from the value recorded in the counter



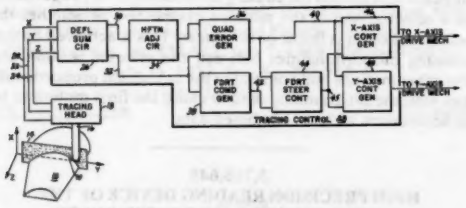
of a number of units equal to the linear movement of the mobile member corresponding to the angular displacement of the rotating diaphragm.

3,715,646

TRACING FEED RATE STEERING CONTROL

Robert G. Wise, Loveland, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed July 21, 1971, Ser. No. 164,591
Int. Cl. G05b *11/01*
U.S. Cl. 318—632 **4 Claims**



An improved electronic tracing control for automatically steering the direction of the command feedrate vector to maintain a substantially zero quadrature error.

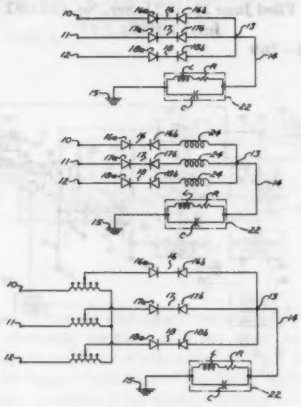
3,715,647

FREQUENCY CONVERTER FOR CONVERTING MULTI-PHASE LOW FREQUENCY ALTERNATING CURRENT INTO SINGLE-PHASE HIGHER FREQUENCY ALTERNATING CURRENT

Paul Peter Biringer, Toronto, Ontario, Canada, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed March 31, 1971, Ser. No. 129,889
Int. Cl. H02m *5/20*
U.S. Cl. 321—7 **4 Claims**

There is disclosed herein a solid state frequency changer wherein multiple phase supply current is converted to single phase current of increased frequency. Each line of the multiple phase supply is provided with a pair of reverse switching rectifiers or PNPN devices connected back-to-back in series therewith. A load is connected between a common point of



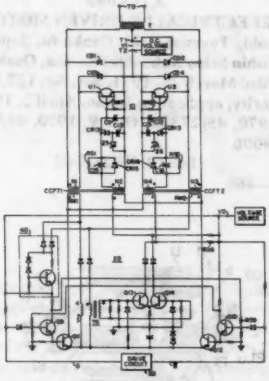
the multiple phase supply and a ground or an artificial neutral point.

3,715,648

TECHNIQUE FOR USE OF CONTROLLED CURRENT FEEDBACK TRANSFORMERS IN POWER INVERTER APPARATUS

Andress Kernick, Murrysville, Pa.; Glenn W. Ernsberger, Worthington, Ohio; John F. Vonderembse, and Manvel A. Geyer, both of Lima, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1972, Ser. No. 222,522
Int. Cl. H02m *1/18, 7/52*
U.S. Cl. 321—11 **4 Claims**



A technique for improving the interlock operation of a power inverter apparatus including a power stage operatively coupled to a steering stage by a controlled current feedback

transformer (CCFT). Each of the stages includes a pair of switching devices and the alternate conduction of the switching devices controls the conductive state of the switching devices of the power stage. An interlock circuit operatively coupled between the power stage and steering stage controls the conductive states of the switching devices of the steering stage in response to current flow in the switching devices of the power stage. A residual bias circuit is operatively connected to the steering stage to maintain the switching devices in a conductive state for a period of time to assure effective interlock circuit operation. A non-linear energy absorbing device, such as a transformer is positioned intermediate to said CCFT and said interlock circuit to absorb erroneous currents produced by stored energy in the core of the CCFT.

3,715,649

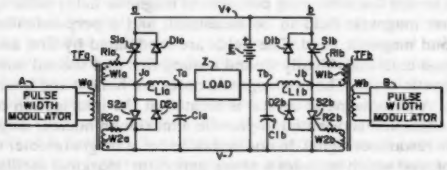
STAGGERED PHASE PULSE WIDTH MODULATED INVERTER APPARATUS

Richard J. Ravas, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 25, 1967, Ser. No. 611,697

Int. Cl. H02m *7/52*

U.S. Cl. 321—45 R **9 Claims**



This disclosure describes an inverter utilizing semiconductor switching devices, such as transistors or gate controlled switches, in the legs of the inverter. The legs are connected in a bridge circuit and to a source of direct current. A filter network is connected between the legs and a load across which the alternating output of the inverter is to be developed. The devices are gated on by the application of pulse width modulated signals having an actual carrier frequency to the control electrodes of the devices of the various legs of the inverter. The pulse width modulated signals are applied to the various legs in a predetermined staggered phase relationship so that the effective carrier frequency as seen by the filter network is a higher multiple of the actual carrier frequency. Thus, the filter network need only filter out the effective carrier frequency rather than the lower actual carrier frequency, while the switching devices are switched at the actual carrier frequency at high efficiency.

3,715,650

PULSE GENERATOR FOR IGNITION SYSTEMS

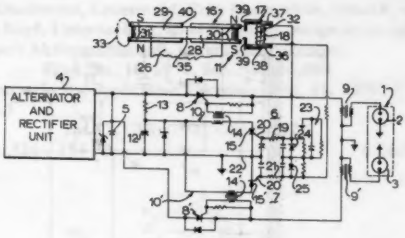
James R. Draxler, Fond du Lac, Wis., assignor to Brunswick Corporation, Chicago, Ill.

Filed Nov. 23, 1971, Ser. No. 201,456

Int. Cl. F02p *1/00*

U.S. Cl. 322—51 **10 Claims**

A capacitor discharge ignition includes a pulse generator coupled to an engine establish pulse signals to trigger a thyristor at all speeds including engine cranking speed. The generator includes a permanent magnet rotor formed in a continuous doughnut shape having planar faces, with 180° axially polarized with one polarity and the opposite 180° directly oppositely polarized. Circumferential pole shoes of slightly less than 180° in length are centrally secured to the top and bottom of each magnet and project radially therefrom. A common pick-up winding is wound on a generally U-shaped core which opens toward the rotor with the ends of the arms aligned with and adjacent the outer edges of upper an lower



shoes. The rotation of the rotor results in the reversal of flux within the pick-up core at each of the abutting sections with the corresponding single polarity pulse being generated as the rotor moves by the U-shaped core.

3,715,651

ANALOG-TYPE CONSTANT-CURRENT REGULATOR

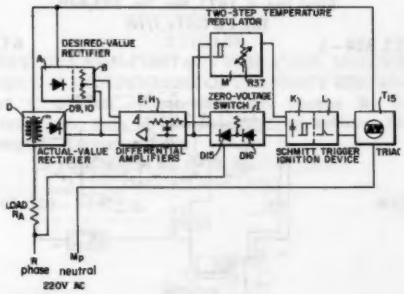
Erich Ott, Rudiger Strasse 15, Wiesbaden, Germany

Filed Jan. 4, 1971, Ser. No. 103,733

Claims priority, application Germany, Jan. 2, 1970, P 20 00 130.3

Int. Cl. G05f *1/44, 5/00*

U.S. Cl. 323—4 **33 Claims**

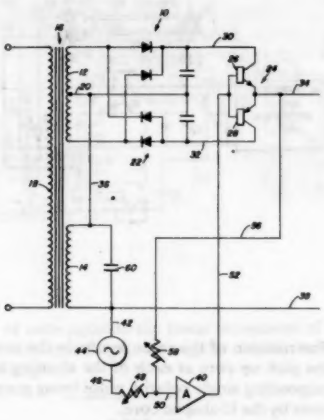


Analog-type constant-current regulator which works as an alternating-current setting controller. It operates with a phase-angle split control and a zero-voltage switch. Across a rectifier, the actual value is impressed as a current. The regulator is suitable in particular for obtaining, independently of the load, a constant, effective alternating current, as a matter of example, for heating protective housings and small-diameter conduits in which measurements are made of liquid and gaseous substances. The main circuit of the regulator includes a series connection of the load with a transducer forming part of an actual-value rectifier circuit and a control circuit which is preferably in the form of a Triac.

3,715,652
HIGH SPEED BUCK-BOOST ALTERNATING CURRENT REGULATOR

Robert O. Elliston, Del Mar, Calif., assignor to Elgar Corporation, San Diego, Calif.

Filed March 15, 1972, Ser. No. 234,973
Int. Cl. G05f *1/38*; H02m *5/44*
U.S. Cl. 323—45 3 Claims

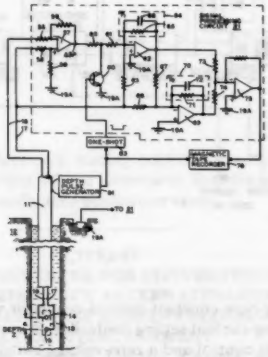


An alternating current regulator in which all current flowing to an output conductor from a secondary winding of a transformer flows through a power amplifier, including the current flowing through a feedback loop.

3,715,653
WELL LOGGING METHODS AND APPARATUS FOR CONVERTING SPATIAL DERIVATIVE MEASUREMENTS TO TIME DERIVATIVE MEASUREMENTS

William D. Sauter, Sherman, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,449
Int. Cl. G01v *3/18*
U.S. Cl. 324—1 6 Claims

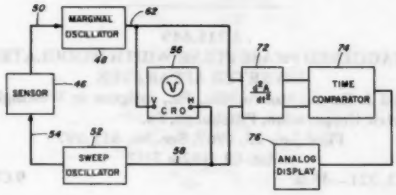


In accordance with illustrative embodiments of the present invention, a technique is disclosed for converting a spatial derivative well logging measurement to a time derivative one. Pulses having a rate representative of the velocity of the electrode are used in converting the spatial derivative to a time derivative. This is accomplished in connection with a system which combines a measurement of the difference between the potentials at electrodes in a borehole and at the surface of the earth with a measurement of the gradient or spatial derivative of the potential at the electrode in the borehole to produce a compensated measure of the spontaneous potential.

3,715,654
CRYSTAL MAGNETOMETER AND GRADIOMETER

John F. Scarzello, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 4, 1970, Ser. No. 43,330
Int. Cl. G01r *33/08*
U.S. Cl. 324—.5 R 2 Claims

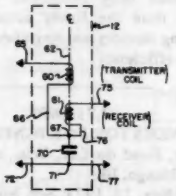


A sensor for measuring component magnetic fields utilizing a first magnetic field to be measured, and a perpendicular second magnetic field. The fields are modulated by first and second coils individually wound around first and second nonmagnetic cores. The nonmagnetic cores are hollow and intersect. A paramagnetic crystal is located at the intersection of the cores and is oriented to provide a maximum nuclear magnetic resonance signal. In one embodiment, a magnetometer is employed which includes a sweep generator, marginal oscillator, feedback loop and the sensor for determining the magnitude of the component magnetic field to be measured. An alternative embodiment utilizes a sweep generator, marginal oscillator, differentiating network and the sensor for determining the point gradient of the fiel to be measured.

3,715,655
INDUCTION LOGGING APPARATUS HAVING A COMMON SERIES ELEMENT FOR NULLING

Donald J. Dowling, and George R. Atwood, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,749
Int. Cl. G01v *3/10, 3/18*
U.S. Cl. 324—6 2 Claims



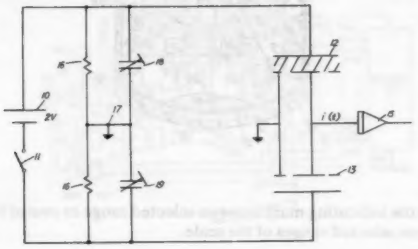
Induction logging apparatus employing a transmitter coil with a receiver coil spaced therefrom along a common axis. It has an excitation circuit for the transmitter coil and an output circuit for signals induced in the receiver coil, thus a common circuit for nulling the direct coupled receiver signals. All three of the circuits are located on a logging sonde that may be run down a well.

3,715,656

METHOD AND APPARATUS FOR MEASURING THE CHARGE-TIME RESPONSE OF MATERIALS BY APPLYING A VOLTAGE STEP ACROSS THE SAME

Peter John Hyde, Codicote, Hitchin, Hertfordshire, and Wilson Reddish, London Colney, Hertfordshire, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 4,012, Jan. 19, 1970, abandoned. This application May 27, 1971, Ser. No. 147,523
Int. Cl. G01n *27/26*
U.S. Cl. 324—61 R 24 Claims



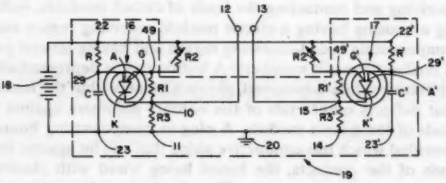
A method and apparatus for measuring the charge-time response of an insulating material to a voltage step applied across it by applying to a capacitor containing a specimen of the material as dielectric, a voltage step or repeated voltage steps in the form of a pulse train, and sampling the charge on the specimen after a time interval from the application of the voltage step, said time intervals increasing logarithmically with successive samples. The charge-time response data obtained is particularly suited to the determination of permittivity and loss factor with frequency using approximations to the Fourier transform

3,715,657

TRANSDUCER FOR CONVERTING SELECTED ENVIRONMENTAL PARAMETER DIFFERENTIALS TO FREQUENCY DIFFERENTIALS

Robert W. Sampson, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 28, 1970, Ser. No. 101,651
Int. Cl. G01n *31/08*; H03k *17/60*
U.S. Cl. 324—140 R 2 Claims



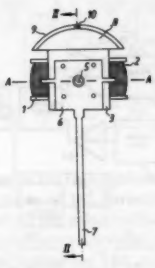
To form a transducer, two uniformly d.c. biased signal detector means are connected in parallel. Each of these signal detector means includes a variable resistor that controls the output frequency of that signal detector means. The variable resistors are located in environments differing only in a parameter for which differential measurement is desired. Such parameters include temperature, thermal absorption, and other variables that affect electrical current flow in the resistors. A non-uniform change in the variable resistors changes the frequency differential existing between the two signal detector means.

3,715,658

ROTARY COIL ASSEMBLY WITH COUNTER-BALANCE FOR AN ELECTRICAL MEASURING INSTRUMENT AND METHOD OF MAKING THE SAME

Willy Kisselmann, Gruenwald; Fritz Ruempelein, Munich, and Paul Kopf, Unterhaching, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 10, 1971, Ser. No. 206,668
Claims priority, application Germany, Dec. 11, 1970, P 20 60 986.3
Int. Cl. G01r *1/00*; G01d *13/22*
U.S. Cl. 324—154 PB 6 Claims



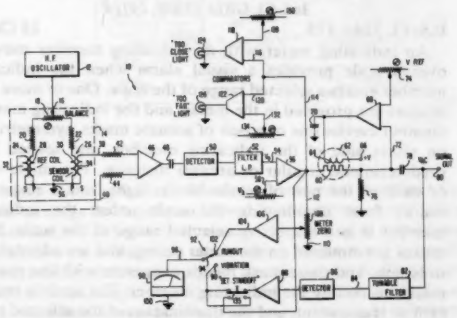
A rotary coil for an electrical measuring instrument is made by providing the coil frame with a winding and with needle bearings. A pointer is mounted on the frame and a section of synthetic plastic material is mounted on the frame as a counterbalance. The section is heavier than the pointer and is provided with an arcuate wall portion curved over a portion of arc with a plane of symmetry coinciding with the axis of rotation of the frame. The wall portion is then provided with one or more slots so located, and with sufficient material being removed, that the existing imbalance is corrected and the coil is balanced.

3,715,659

INDUCTIVE NON-CONTACT VIBRATION ANALYZER WHICH IS INDEPENDENT OF STANDOFF DISTANCE

Albert C. Abnett, Westerville, and George B. Foster, Worthington, both of Ohio, assignors to Reliance Electric Company, Columbus, Ohio

Filed March 25, 1970, Ser. No. 22,416
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 D 6 Claims



Disclosed is a non-contact vibration analyzer that is substantially independent of standoff distance. An inductive

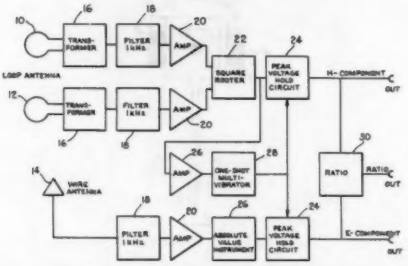
probe produces an electrical output having AC and DC components that vary similarly with standoff. An automatic gain control circuit maintains the DC component constant so that the AC output signal is representative of vibration and does not vary with standoff. By connecting the probe through a meter zero potentiometer and switch to a DC meter, the analyzer also indicates shaft runout.

3,715,660

DETERMINING DISTANCE TO LIGHTNING STROKES FROM A SINGLE STATION

Lothar H. Ruhnke, Boulder, Colo., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 30, 1971, Ser. No. 213,949
Int. Cl. G01r *31/02*
U.S. Cl. 324—72 **4 Claims**



Apparatus for determining the distance to lightning strokes from a single station. The apparatus includes a first loop antenna system for sensing the magnetic field produced by the lightning which signal is filtered, square rooted, and fed into a peak voltage holding circuit. A second antenna is provided for sensing the electric field produced by the lightning which is fed into a filter, an absolute value meter, and to a peak voltage holding circuit. A multivibrator gates the magnetic and electric signals through the peak holding circuits to a ratio meter which produces a signal corresponding to the ratio between the magnetic component and the electric component. The amplitude of this signal is proportional to the distance from the apparatus to the lightning stroke.

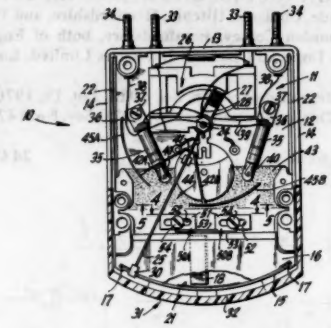
3,715,661

INDICATING METER WITH VISUAL ALARM

Alfred Henry Posey, West Haven, and Harry Clifford Quick, Jr., Weston, both of Conn., assignors to Sigma Instruments, Inc., Braintree, Mass.

Filed March 24, 1969, Ser. No. 809,602
Int. Cl. G01r *15/08*, *19/14*
U.S. Cl. 324—115 **15 Claims**

An indicating meter with an indicating member movable over a scale provides a visual alarm when the indicating member enters a selected range of the scale. One or more light sources are provided in the meter, and the indicating member member carries one or a pair of arcuate masks, symmetrically on either side of the indicating member, and spaced by a predetermined angular or arcuate distance. The single mask or each of the pair of masks blocks light from a respective source from illuminating the scale unless the indicating member is in a respective selected range of the scale. Mask means are mounted on the meter casing, and are adjustable as to length, and these mask means cooperate with the mask or masks carried by the indicating member. The scale is translucent or transparent, and the illumination of the selected range of the scale, when the indicating member moves into such range, provides a visual alarm. If desired the visual alarm may be a colored illumination. In a modification, a photocell arranged in a suitable electronic circuit with one or more transistors is arranged to effect the illumination of a lamp



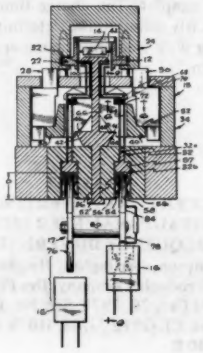
when the indicating mark enters a selected range or one of two or more selected ranges of the scale.

3,715,662

TEST CONTACTOR HEAD FOR CIRCUIT MODULES

Bernd H. Richelmann, San Diego, Calif., assignor to Republic Corporation, Beverly Hills, Calif.

Filed Nov. 19, 1970, Ser. No. 90,952
Int. Cl. G01r *31/22*, *15/12*
U.S. Cl. 324—158 F **8 Claims**



A contactor head useful in a testing complex for quickly receiving and contacting the leads of circuit modules, including a housing having a circuit module-receiving region and a compensating board-receiving region and having several pairs of resilient contact members. A button that is depressed when a circuit module is received, pivots a comb within the housing that deflects outer ends of the contact members against the leads of the circuit module. A plug-in compensating board is provided which has conductive strips that can lie against inner ends of the contacts, the board being wired with electrical compensating components. The plug-in boards enable rapid change of compensation to enable the same contactor head to be used for a variety of different circuit modules. An oil or grease film spread on the compensating board reduces current leakage from moisture condensation.

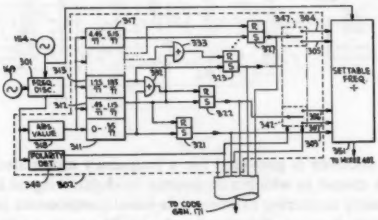
ERRATUM

For Class 324—58.5 B see:
Patent No. 3,715,667

3,715,663
DOPPLER COMPENSATION BY SHIFTING TRANSMITTED OBJECT FREQUENCY WITHIN LIMITS

Charles R. Laughlin, Silver Spring, Md.; Roger C. Hollenbaugh, Shippensburg, Pa., and Walter K. Allen, Silver Spring, Md., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Division of Ser. No. 701,679, Jan. 30, 1968, Pat. No. 3,534,367. This application June 18, 1970, Ser. No. 47,440
Int. Cl. H04b 7/20
U.S. Cl. 325—4 11 Claims

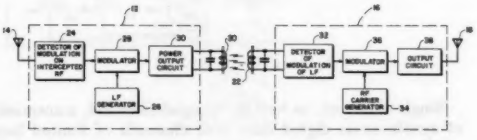


Disclosed are a system and method for position locating, deriving centralized air traffic control data and communicating via voice and digital signals between a multiplicity of remote aircraft including supersonic transports and a central station, as well as a peripheral ground station (or stations), through a synchronous satellite relay station. Side tone ranging patterns, as well as the digital and voice signals, are modulated on a carrier transmitted from the central station and received on all of the supersonic transports. Each aircraft communicates with the ground stations via a different frequency multiplexed spectrum. Supersonic transport position is derived from a computer at the central station and supplied to a local air traffic controller. Position is determined in response to variable phase information imposed on the side tones at the aircrafts, with a plurality of different side tone techniques being employed, and relayed back to the transports. Common to all of the side tone techniques is Doppler compensation for the supersonic transport velocity.

3,715,664
METHOD OF REPEATING RF-BORNE SIGNAL ACROSS AN EARTH BARRIER

Kurt Ikrath, Elberon, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 12, 1971, Ser. No. 114,853
Int. Cl. H04b 7/14
U.S. Cl. 325—9 3 Claims

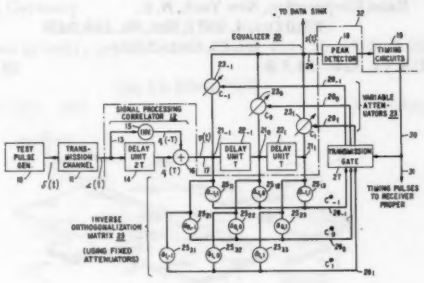


A method of relaying VHF in mountainous terrain that includes planting a receiver and a transmitter, that operate at the same carrier frequency, on opposite sides of a mount such that the mountain between them shields the receiver from rf radiated by the transmitter, and transferring intelligence on the rf detected by the receiver through the earth to the transmitter by means of a magnetic or seismic link. The magnetic link can transfer audio band frequency while the seismic link can transfer mark-space coded intelligence.

3,715,665
JOINT INITIAL SETTING OF ATTENUATOR COEFFICIENTS AND SAMPLING TIME IN AUTOMATIC EQUALIZERS FOR SYNCHRONOUS DATA TRANSMISSION SYSTEMS

Robert Wu-lin Chang, Middletown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed June 15, 1971, Ser. No. 153,184
Int. Cl. H03h 7/36
U.S. Cl. 325—42 7 Claims

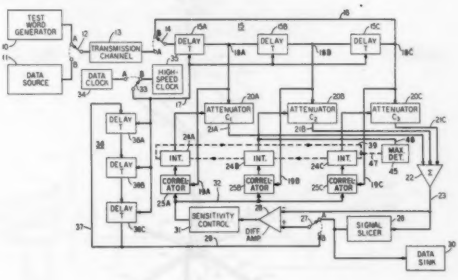


Method and apparatus for rapid joint setting in synchronous data transmission systems of the parameters of sampling time and transversal equalizer tap gain coefficients utilizes auxiliary delay means for a preliminary correlation of samples of transmitted test pulses and reference test pulses to obtain a signal which after application to the transversal equalizer generates an output wave whose peak coincides with the optimum sampling instant. This effect is assured by inversely orthogonalizing the tap output signals from the transversal equalizer. Once the optimum sampling time is established the tap gains can be set in a single adjustment to provide an open data eye pattern.

3,715,666
FAST START-UP SYSTEM FOR TRANSVERSAL EQUALIZERS

Kurt Hugo Mueller, Matawan, and David Adams Spaulding, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed March 30, 1971, Ser. No. 129,328
Int. Cl. H03h 7/36
U.S. Cl. 325—42 9 Claims



Initial convergence of automatic transversal equalizer tap gain settings is rapidly achieved without first establishing synchronization between a test signal incoming at a receiving location over a distorting transmission channel and a locally generated ideal reference signal. Identical periodic digital patterns of fixed length equal to the number of taps available on the equalizer comprise the respective test and reference signals. Error signals obtained from a comparison of test and reference signals at an arbitrary speed which need not be re-

lated to the data rate assigned to the transmission channel are correlated with tap signals to obtain a sequence of coarse tap gain coefficients. Just prior to message data transmission this sequence is cyclically shifted with respect to the tap locations to align the highest of them at an assigned reference location.

3,715,667

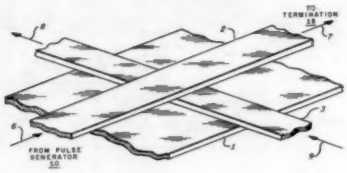
NON-DESTRUCTIVE ELECTROMAGNETIC ENERGY TESTING OF WEB MATERIAL

Alexander M. Nicolson, Concord, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,213

Int. Cl. G01r *27/04*

U.S. Cl. 324—58.5 B **13 Claims**



The forward or back scattered high frequency energy from a moving web of dielectric material exposed to incident impulses of base band duration electromagnetic energy in a parallel plate transmission line is continuously monitored by a signal sampling and comparison system for providing defect-stimulated alarm or control signals.

3,715,668

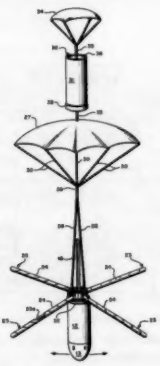
AIR-LAUNCHED RADIO APPARATUS

Theodore C. Herring, New Hope; Ernest F. Bracht, Jenkintown; Robert E. Ainslie, Glenside; Eugene M. Todd, Doylestown, and Joseph J. Franz, Philadelphia, all of Pa., assignors to The United States of America as represenced by the Secretary of the Army

Filed Sept. 26, 1967, Ser. No. 670,807

Int. Cl. H04b *1/02*

U.S. Cl. 325—112 **11 Claims**



An air-deliverable package for radio apparatus having a self-deploying antenna system including a flexible RF radiating element and laterally projecting, flexible ground plane elements which are foldable about a packed main parachute received within a tubular container which, in turn, is detachably connected to the aft end of the package and is separated therefrom by deployment of a pilot chute to enable deployment of the main parachute and the antenna system.

3,715,669

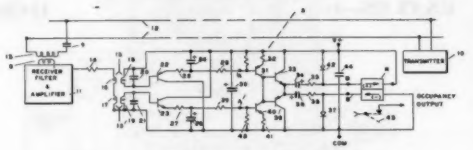
RECEIVER FOR A FREQUENCY MODULATED OVERLAY TRACK CIRCUIT

John P. LaForest, Conesus, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,453

Int. Cl. B61l *21/10*; G08b *13/22*; H04b *1/16*

U.S. Cl. 325—320 **18 Claims**



A receiver is provided for a frequency modulated overlay track circuit in which a frequency modulated signal having alternately occurring extreme side-band components is communicated along a railroad right of way. The system which is subject to the influence of the presence of a railroad vehicle comprises, a tuner means responsive to the F.M. signals separating one side-band component of the signal from the other and polarizing means for generating distinctive signals of opposite polarity in response to the respective side-band components. A relay is provided which is responsive to the distinctive signals occurring periodically and alternately for providing manifestation of a clear right of way.

3,715,670

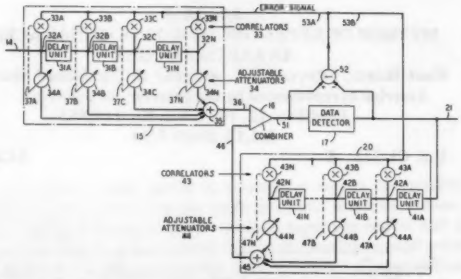
ADAPTIVE DC RESTORATION IN SINGLE-SIDEBAND DATA SYSTEMS

Donald Hirsch, Holmdel, and David Adams Spaulding, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1971, Ser. No. 209,654

Int. Cl. H04b *1/68*

U.S. Cl. 325—331 **5 Claims**



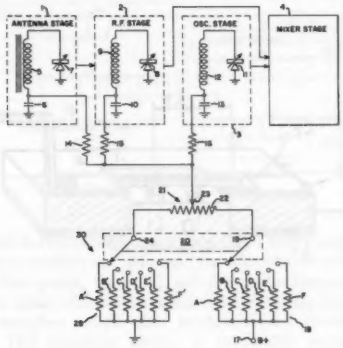
Single-sideband, as well as vestigial-sideband, transmission of synchronous digital data over channels of limited bandwidth, such as voice telephone channels, is facilitated by removing low-frequency signal energy at the transmitter to provide frequency space for a demodulating carrier component and by adaptively restoring such energy at the receiver after demodulation. A first transversal filter in series with, and a second transversal filter in parallel feedback relationship with a data detection circuit at the receiver are made jointly responsive to a common error component to both equalize and restore dc components adaptively to a received signal. More efficient bandwidth utilization than that achieved in systems using bandedge pilot ones is thereby attained.

3,715,671

MULTIPLE SPREADBAND TUNING IN A VARACTOR TUNED RADIO RECEIVER

Joseph A. Worcester, Frankfort, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,331
Int. Cl. H04b 1/16
U.S. Cl. 325—468 4 Claims



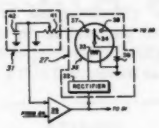
In a radio receiver including varactors for tuning the receiver, a circuit is provided for regulating the range of voltage impressed upon the varactors, to tune the receiver to any selected one of a plurality of spreadbands. This circuit includes first, second, and third variable resistances. A first contact means simultaneously adjusts the resistance of the first and second variable resistances to vary the ratio therebetween for impressing a given range of voltage across the varactors to tune to a selected spreadband. A second contact means adjusts the third variable resistance means to impress a particular voltage, within the given range of voltage, upon the varactors to tune the receiver to a particular frequency within the selected spreadband.

3,715,672

SONIC DETECTION APPARATUS

Henry Suter, Hatboro, Pa., assignor to the United States of America as represented by the Secretary of the Navy

Division of Ser. No. 31,042, Apr. 9, 1970, Pat. No. 3,646,506.
Filed Nov. 18, 1971, Ser. No. 199,868
Int. Cl. H03k 17/00
U.S. Cl. 328—150 7 Claims



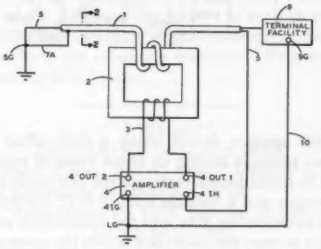
An improved swimmer and floater detector having a sonic generator and receiver and a shift detector indicating the doppler frequency difference between the generated and received sonic waves within a guarded volume of flowing water. The shift detector output is passed to a plurality of adjacent narrow bandpass filters, each being connected via a respective gain-controlled amplifier to a common multiple frequency meter. The amplifier gain control is non-proportional to the output amplitude and is operative in two modes to steadily increase or decrease the gain when the output is below or above threshold respectively.

3,715,673

NOISE SUPPRESSION FOR COMMUNICATION CABLES

Walter Baum, Nurnberg, and Michael Still, Langenhagen, both of Germany, assignors to Baum Electrophysik GmbH, Nurnberg, Germany

Filed Feb. 17, 1971, Ser. No. 116,182
Claims priority, application Germany, Feb. 19, 1970, P 20 07 641.9
Int. Cl. H04b 3/28
U.S. Cl. 328—165 11 Claims



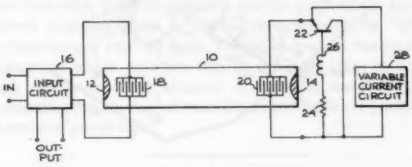
Noise developed along the sheath (or shield) of a communications cable, is bucked out by means of an amplifier-transformer combination located in proximity to the terminal facility which receives a cable. The bucking voltage is applied to the sheath itself. The sheath itself may be wound so as to constitutes the secondary winding of the transformer.

3,715,674

ELECTRICALLY CONTROLLED REFLECTION OF ACOUSTIC SURFACE WAVES

Alfred J. Bahr, Mountain View, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed July 23, 1971, Ser. No. 165,638
Int. Cl. H03h 7/30; H03f 3/04
U.S. Cl. 330—12 5 Claims

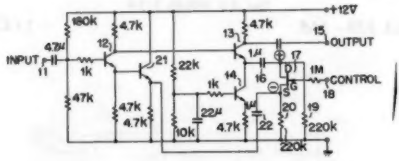


A circuit is provided for tuning out the reactance established at the electrical port of an acoustical surface wave transducer thereby providing near perfect reflection of the acoustic surface waves. The variable impedance circuit, which is controlled electrically, besides a positive reactance generates a negative resistance that can be used to provide reflection and transmission gain for the surface waves.

3,715,675
VARIABLE RESISTOR DEVICE USING A FIELD TRANSISTOR

Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha,. Hamamatsu-chi, Shizuoka-ken, Japan

Filed Sept. 8, 1971, Ser. No. 178,680
Claims priority, application Japan, Sept. 10, 1970, 45/79112; Sept. 10, 1970, 45/79113
Int. Cl. H03g 3/30
U.S. Cl. 330—28 6 Claims

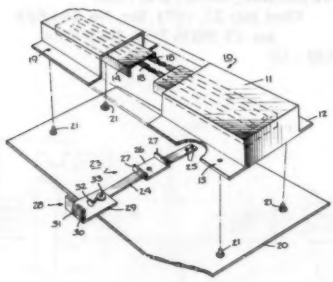


A variable resistor device using a field effect transistor wherein two resistors having an equal value of resistance are connected in series between the source and drain of the field effect transistor and a variable control D.C. voltage source is connected between the gate and the connection point of the two resistors to vary the resistance across the source and drain with an improved linearity. The variable resistor device is preferably adapted to be connected to an amplifier to control its gain with little distortion of A.C. signals.

3,715,676
CLAMP FOR A REVERBERATION UNIT

Murray S. Figlin, Linden, and John R. Boenisch, South Plainfield, both of N.J., assignors to The Ampeg Company, Inc., Linden, N.J.

Filed Jan. 28, 1970, Ser. No. 6,368
Int. Cl. H03h 1/00
U.S. Cl. 333—30 R 14 Claims

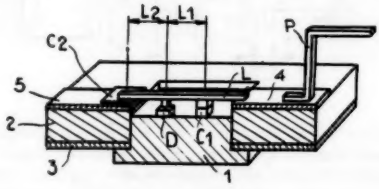


The clamp is mounted within a reverberation unit so as to hold reverberation springs in place during transportation. The clamp is actuated by pushing an actuator into the unit so as to deflect a leaf spring and bring a channel-shaped holder thereon into restraining position about the reverberation springs. Movement of the actuator out of the unit allows the leaf spring to flatten and the holder to be moved away from the reverberation springs.

3,715,677
AMPLIFIERS OF HYBRID INTEGRATED SUBMINIATURISED CIRCUIT DESIGN

Claude Vergnolle, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 28, 1971, Ser. No. 110,465
Claims priority, application France, Feb. 3, 1970, 7003737
Int. Cl. H03f 3/04
U.S. Cl. 330—31 4 Claims

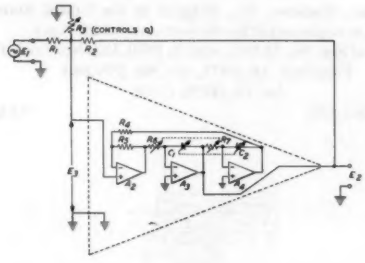


A tunnel diode or transistor amplifier in the form of a hybrid integrated circuit, whose gain bandwidth product is as large as possible. The amplifier comprises a circuit having a band-pass filter structure, whose coil elements form the linking structures.

3,715,678
ACTIVE ELECTRICAL FILTER

Harry S. Reichard, Princeton, N.J., assignor to Princeton Applied Research Corporation, Princeton, N.J.

Filed July 27, 1971, Ser. No. 166,381
Int. Cl. H03f 1/36
U.S. Cl. 330—86 6 Claims



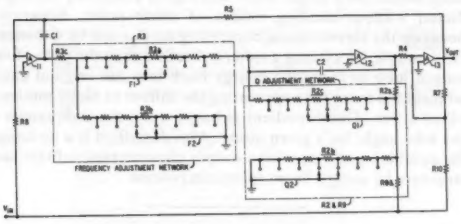
An active electrical filter having an input, output and circuit common, and providing Q variation without affecting on-resonance gain, and including amplifier means including an inverting input and having a complex gain function G(S) which equals K $(ST/[(ST)^2+1])$; and combining means including a single variable element for combining the filter input and output and for applying the resultant thereof to the inverting input of said amplifier means, adjustment of said variable element providing said Q variation without affecting on-resonance gain of said filter.

3,715,679

ACTIVE RC DELAY EQUALIZER

Paul Egon Fleischer, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 29, 1971, Ser. No. 167,241
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 **13 Claims**



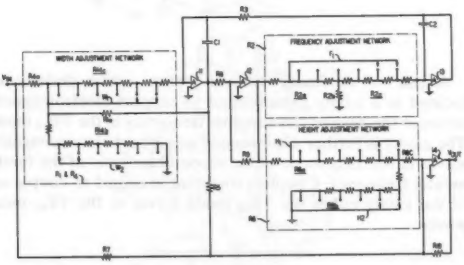
An active resistance-capacitance (RC) delay equalizer circuit which exhibits an "all-pass" transfer characteristic is disclosed. The quality factor, Q, and the center frequency of the equalizer delay characteristic are independently adjustably by sliding switches which alter predetermined circuit resistor values. The equalizer circuit is preferably realized using operational amplifiers bonded to a thin film circuit substrate.

3,715,680

ACTIVE RC LOSS EQUALIZER

Paul Egon Fleischer, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 29, 1971, Ser. No. 167,242
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 **13 Claims**



An active resistance-capacitance (RC) loss equalizer circuit which provides a second order "bump" in the frequency domain is disclosed. The bump height, bump width, and bump center frequency are independently adjustable by sliding switches which alter predetermined circuit resistor values. The equalizer circuit is preferably realized using operational amplifiers bonded to a thin film circuit substrate.

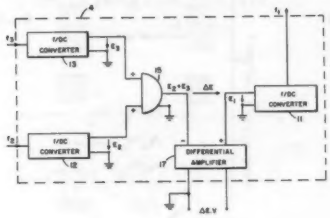
3,715,681

FREQUENCY DISCRIMINATOR WITH VARIABLE CENTER FREQUENCY

Franz Peter Madert, D-8541 Greding der Bundeswehr, Germany, assignor to The United States of America as represented by the Secretary of the Army

Filed March 13, 1972, Ser. No. 234,092
Int. Cl. H03b *3/04*
U.S. Cl. 331—11 **2 Claims**

The frequencies of a reference oscillator, a voltage controlled oscillator and a signal source are all converted to dc voltages proportional to their individual frequencies. The voltages from the signal and the voltage controlled oscillator are summed in a summing amplifier and fed to one input of a differential amplifier. The other input of the differential amplifier is fed by the dc voltage from the reference oscillator. The dc output of the differential amplifier is used to control the variable controlled oscillator so that its frequency output will be different from the reference oscillator's frequency output by the frequency of the signal.

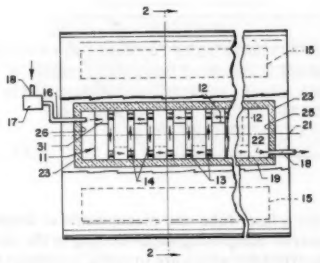


3,715,682

RECTANGULAR DISC LASER

Charles Gilbert Young, Storrs, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed March 19, 1970, Ser. No. 20,946
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 P **9 Claims**



A rectangular-disc laser structure of all-glass support construction. A segmented neodymium-doped glass laser rod is supported in a glass tubing and is designed to permit fluid coolant flow within the tubing and amongst the rod segments. The non-laserable glass supporting means consists of samarium-doped cladding glass to reduce interference by "off axis" spontaneously emitted light. The fluid coolant has an index of refraction which matches that of the laser glass to achieve a high efficiency. The absence of metallic supporting means minimizes the chance of metallic decomposition under the influence of pump light.

3,715,683

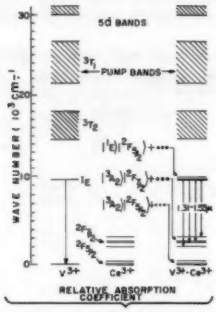
COUPLED ION EYE-SAFE LASER

Marvin J. Weber, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 19, 1971, Ser. No. 116,987
Int. Cl. H01s *1/02, 3/10*
U.S. Cl. 331—94.5 **11 Claims**

A coupled ion laser operating at a frequency determined by the energy levels characteristic of the coupling of a lanthanide or actinide group ion with an iron group ion in an orthoalu-

minate material, such as yttrium orthoaluminate, is described in which low threshold high efficiency starting operation at



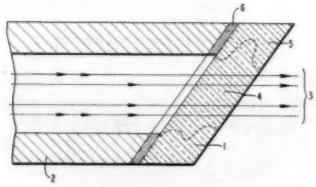
predetermined frequencies in the region of eye safety is provided.

3,715,684

WINDOW FOR A LASER TUBE END PIECE

Jean-Pierre Biet, Saulx-les-Chartreux, France, assignor to Compagnie General D'Electricite, Paris, France

Filed April 10, 1972, Ser. No. 242,537
Claims priority, application France, April 9, 1971, 7112779
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 **11 Claims**



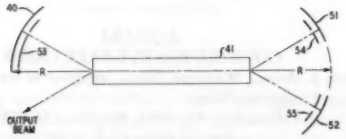
A window for a laser tube end piece, made of doped semiconductor material comprising super-doping in the vicinity of the parts of the windows which are to come in contact with the end pieces of the laser tubes.

3,715,685

HIGH EFFICIENCY INJECTION LASER CAVITIES

Eugene Irving Gordon, Covent Station, and Dan Maydan, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 30, 1971, Ser. No. 139,009
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 C **12 Claims**



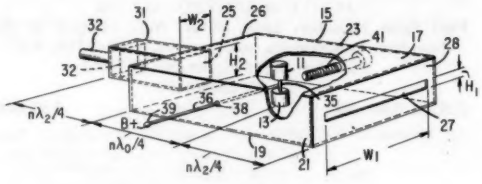
The specification describes injection lasers employing heterosemiconductor structures for obtaining an enlarged cross-sectional area cavity defined by an optical waveguide terminated by the cleaved faces of the semi-conductor structure (usually known as mirrors). The enlarged area of the cavity allows higher power output from the laser for the same power density on the mirrors. The power density is limited by damage to the mirrors. The waveguide produces an output consisting of two plane wave lobes for each mode. Techniques for mode enhancement are described from which higher ultimate power for a single mode and higher efficiency can e predicted without exciting modes of other order. Separation between the thresholds of competing modes can be enhanced, for example, by placing a spherical reflector in the path of one output lobe to focus the energy back into the original cavity while at the same time aperturing the mirror to block modes of other order. This expedient is based upon the uniqueness of the lobe angle for a given mode. Also described is a technique for combining the dual lobe output characteristic of this laser structure by using a beam splitter in reverse.

3,715,686

PAIRED NONLINEAR ACTIVE ELEMENTS IN A WAVEGUIDE CAVITY ADAPTED TO SUPPORT ORTHOGONAL TE MODE WAVES AND TE MODE WAVES

Barry Stuart Perlman, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed March 31, 1971, Ser. No. 129,807
Int. Cl. H03b *7/14*
U.S. Cl. 331—96 **7 Claims**



A pair of nonlinear semiconductive active devices are located in a cavity dimensioned to support electromagnetic waves at the desired fundamental frequency in the TE_{10} mode. The cavity is further dimensioned to support electromagnetic waves in the TE_{01} mode at the second harmonic of the fundamental frequency. Coupling irises are arranged to couple out of the cavity either the TE_{10} mode waves or the TE_{01} mode waves.

3,715,687

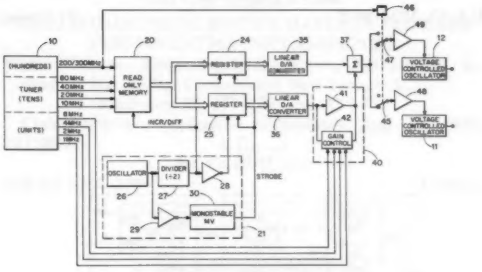
NON-LINEAR VOLTAGE GENERATING APPARATUS

Peter E. Solender, Williamsville, N.Y., assignor to GTE Sylvania Incorporated

Filed April 5, 1972, Ser. No. 241,322
Int. Cl. H03j *5/00*
U.S. Cl. 331—179 **5 Claims**

Non-linear voltage generating apparatus for producing curves of tuning voltages for operating voltage controlled oscillators. Binary signals which indicate the desired output frequency of a voltage controlled oscillator to the 10 MHz value are applied to a read only memory. The read only memory produces an incremental digital output signal of value representing the appropriate voltage for the 10 MHz value and also a companion differential digital output signal of value representing the differential between the voltage for the 10 MHz value and for the next higher 10 MHz value. Both digital output signals are applied to respective linear digital-to-analog converters. The differential analog output signal from the linear digital-to-analog converter and binary signals which indicate the units of MHz of the desired output frequency of the voltage controlled oscillator are applied to interpolating cir-

cuitry. The interpolating circuitry produces an interpolated analog output signal of the proper proportion of the differential analog output signal. The incremental analog output



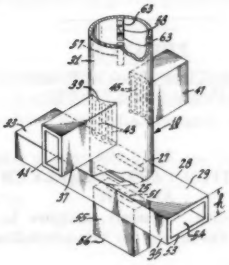
signal and the interpolated analog output signal are added in a summing network to produce the proper tuning voltage causing the voltage-controlled oscillator to operate at the desired frequency.

3,715,688

TM_{01} MODE EXCITER AND A MULTIMODE EXCITER USING SAME

Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,842
Int. Cl. H01p *5/12, 1/16*
U.S. Cl. 333—1 **14 Claims**



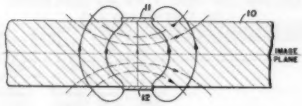
Dual elongated apertures are cut along a broad wall of a rectangular waveguide to excite in electromagnetic waves the TM_{01} mode in a circular waveguide symmetrically joined to the dual apertured region. A multimode exciter system is provided wherein the TM_{01} mode wave is excited as described above and a linearly polarized TE_{11} mode wave is excited in the circular waveguide by a second rectangular waveguide section coupled along the side walls of the circular waveguide. A second TE_{11} mode wave oriented orthogonal to the first mentioned TE_{11} mode wave is excited in the circular waveguide by an elongated aperture cut along the center of the broad wall of the first-mentioned rectangular waveguide opposite that of said first-mentioned broad wall with a third rectangular waveguide symmetrically joined to the center apertured region. A dual channel rotary joint system is herein described using two such multimode exciter systems with the circular waveguide sections connected to each other by a rotary joint section.

3,715,689

WIDEBAND MICROWAVE POWER DIVIDER

Gordon J. Laughlin, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 10, 1972, Ser. No. 225,041
Int. Cl. H01p *1/16, 3/08, 5/12*
U.S. Cl. 333—9 **8 Claims**



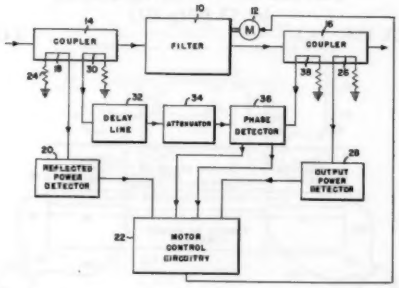
A microwave structure comprising a parallel transmission line that is bisected by a conducting septum to form two independent microstrip circuits that are in anti-phase; i.e., the conducting septum becomes a common ground plane for a pair of equal amplitude microstrip circuits that are in anti-phase relative to the common ground at points equidistant from the point of bisection of the parallel transmission line. In one embodiment, the proprosed microwave structure is utilized as a power divider with input power being supplied to a conventional microstrip circuit formed of a pair of spaced parallel conductor strip members which also form the parallel transmission line and the anti-phase microstrip circuits, and whose widths are varied to form a reflectionless transition from the input microstrip circuit to the parallel transmission line and subsequently to the pair of output microstrip circuits, each of which receives half of the input power supplied to the device.

3,715,690

AUTOMATIC TUNING ELECTRIC WAVE FILTER

Robert W. Young, Erial, and Frederick J. Radler, Mt. Royal, both of N.J., assignors to TRW Inc., Euclid, Ohio

Filed May 18, 1971, Ser. No. 144,100
Int. Cl. H03h *7/10;* **H03g** *5/24*
U.S. Cl. 333—17 **14 Claims**

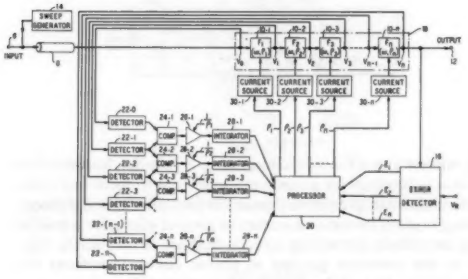


A band pass filter for use in RF transmitting or receiving apparatus comprises a plurality of resonant stages coupled through variable apertures whose areas are dependent on the tuning adjustment of the resonant stages whereby a substantially constant bandwidth and insertion loss are achieved over the tuning range. Tuning is effected by a servomechanism responsive to the conditions of phase and signal level at the input and output ports of the filter. The phase and signal level are sensed through directional couplers at the input and output ports of the filter. The couplers at the filter input and output act as matching sections, thereby minimizing losses.

3,715,691
ADJUSTABLE EQUALIZER HAVING MEANS RESPONSIVE TO THE INPUT AND OUTPUT SIGNALS OF EACH EQUALIZER SECTION

Carl Ferdinand Kurth, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 22, 1972, Ser. No. 227,742
Int. Cl. H04b 3/04
U.S. Cl. 333—18 11 Claims

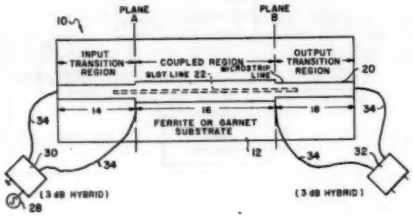


In an adjustable equalizer comprising a plurality of independently adjustable, serially connected equalizer sections, precise signal information about the effect of each section in each of a plurality of frequency ranges is generated by apparatus which compares input and output signal levels of each equalizer section in each frequency range. This information is used in the processing of simultaneously generated signal information indicative of the overall misalignment of the equalizer to produce output signals suitable for controlling adjustment of the equalizer sections to reduce overall misalignment of the system.

3,715,692
MICROSTRIP-SLOT LINE PHASE SHIFTER

Max L. Reuss, Jr., New Carrollton, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 10, 1972, Ser. No. 216,510
Int. Cl. H01p 1/32
U.S. Cl. 333—24.1 8 Claims

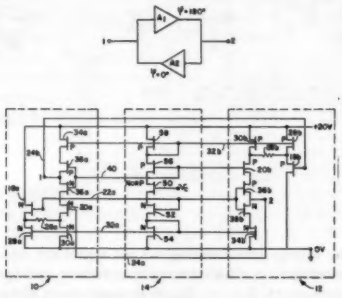


A microwave-integrated-circuit phase shifter comprising a dielectric substrate such as ferrite, one side being metallized to form a slot line and the other being metallized to form a parallelling microstrip transmission line, the two lines being coupled together through the dielectric substrate. A region of circular polarization of the input signal is set up between the lines and a magnetic field which is adjustable in amplitude is applied in the direction of the two lines. Variation of the amplitude of the magnetic field varies the amount of phase shift between the input and output of the device.

3,715,693
GYRATOR EMPLOYING FIELD EFFECT TRANSISTORS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by, and Erwin S. Hochmair, Huntsville, Ala.

Filed March 20, 1972, Ser. No. 236,281
Int. Cl. H03h 7/44, 11/00
U.S. Cl. 333—80 T 31 Claims



A gyrator circuit of the conventional configuration of two amplifiers in a circular loop, one producing zero phase shift and the other producing 180° phase reversal. All active elements are MOS field effect transistors. Each amplifier comprises a differential amplifier configuration with current limiting transistor, followed by an output transistor in cascode configuration, and two load transistors of opposite conductivity type from the other transistors. A voltage divider control circuit comprises a series string of transistors with a central, voltage input to provide control, with locations on the amplifiers receiving reference voltages by connection to appropriate points on the divider. The circuit produces excellent response and is well suited for fabrication by integrated circuits.

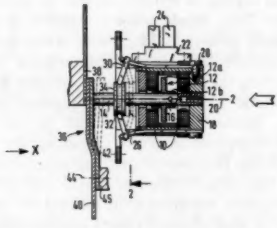
ERRATUM

For Class 333—30 R see:
Patent No. 3,715,676

3,715,694
SOLENOID SWITCH, PARTICULARLY CRYOGENIC SWITCH

Peter Kruger, Munich, Germany, assignor to Max-Planck-Gesellschaft Zur Forderung der Wissenschaften e.v., Gottingen, Germany

Filed Feb. 28, 1972, Ser. No. 229,820
Claims priority, application Germany, Feb. 26, 1971, P 21 09 327.6
Int. Cl. H01h 51/12
U.S. Cl. 335—177 9 Claims



In a two-position solenoid switch an armature made of a non-ferromagnetic material of good electric conductivity is

movable back and forth between two separately energizable spaced coreless coils. The motion of the armature is started by virtue of the interaction between the magnetic field of the energized coil and the magnetic field generated by the eddy-currents induced in said armature by the energized solenoid.

3,715,695

ELECTROMAGNETIC SWITCH HAVING A FLEXIBLE PERMANENT MAGNET ARMATURE

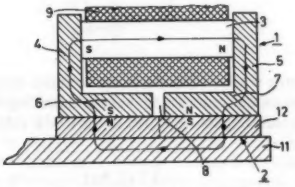
Wytze Hofman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,731

Claims priority, application Netherlands, Aug. 30, 1970, 7012890

Int. Cl. H01f *7/08*

U.S. Cl. 335—229 **7 Claims**



An electromagnetic switch provided with at least one magnetic circuit comprising a permanent magnet, the polarity of which is reversible by means of a magnetizing coil. The permanent magnet is provided with pole pieces which magnetically cooperate with a flat flexible magnet of a movable armature. The flexible magnet may be provided with soft-iron insertion pieces in the regions of the poles. Preferably, the coercive force H_c of the main magnet is smaller than 1,500 oersted and that of the armature magnet is greater than 2,000 oersted.

3,715,696

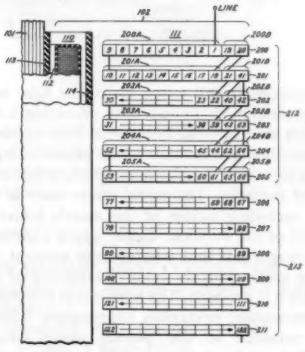
DISC WINDING WITH INTEGRAL LOAD CURRENT CARRYING RIB SHIELDING

Robert E. Gearhart, Rome, Ga., assignor to General Electric Company

Filed May 22, 1972, Ser. No. 255,383

Int. Cl. H01f *15/14*

U.S. Cl. 336—70 **6 Claims**



In electrical transformers of the type which utilize a plurality of axially spaced disc coils connected to form a winding, a turn arrangement for more uniformly distributing surge potentials across and within the winding wherein certain current carrying turns are utilized to provide additional transient current paths through the winding upon the occurrence of a voltage surge.

3,715,697

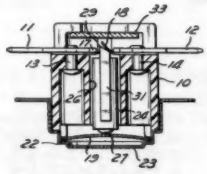
THERMAL FUSE

Edward G. Them, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed May 24, 1971, Ser. No. 146,143

Int. Cl. H01h *37/00*

U.S. Cl. 337—157 **13 Claims**



A thermal fuse is disclosed in which a bimetallic snap disc operates an elongated cutter causing the cutter to engage and rupture a thin metal conductor. Terminal elements provided with sawtooth-like teeth engage the side of the conductor opposite the cutter to provide points of high localized stress which facilitate the cutting or rupturing operation.

3,715,698

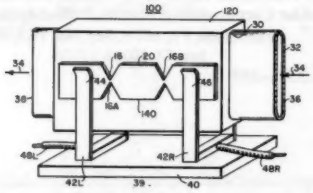
CURRENT LIMITING FUSE

Donald D. Blewitt, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 16, 1971, Ser. No. 115,197

Int. Cl. H01h *85/02*

U.S. Cl. 337—166 **2 Claims**



A current limiting fuse element comprising a fuse link or portions of reduced cross section of such a relatively small area or size that they would normally be unable to support themselves alone. The fuse element is intimately bonded or attached to a relatively larger rigid dielectric mass by methods, such as printing, vacuum deposition or etching, so that the larger dielectric mass provides the structural support for the relatively thin current limiting regions or portions and also assists in removing heat from the fuse element during both normal operation and also during fusing of the fuse element. The fuse element and its dielectric support may be used independently or may be used as the fuse element in a cartridge-type fuse where the entire fuse element is disposed in a casing

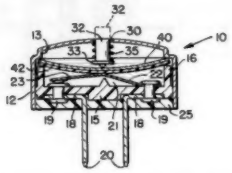
and embedded in a pulverulent, arc quenching material, such as sand, which may be provided to assist in arc extinction upon fusing of the fuse element and to absorb the heat during fusing. In addition, the relatively rigid, dielectric mass may be adapted to accommodate or receive a heat transferring means through which fluid may flow. Heat generated during normal operation of the fuse or during a fusion operation may be removed by the moving fluid.

3,715,699

THERMOSTAT WITH RESET PIN

Charles John Hire, Pittsford, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed July 15, 1971, Ser. No. 162,975
Int. Cl. H01h *37/70*
U.S. Cl. 337—348 **2 Claims**



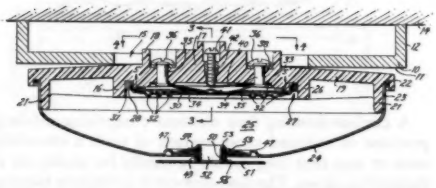
A reset pin is mounted to reciprocate in one end of a thermostat, and a pair of terminals project from the opposite end. A switch in the thermostat is normally held closed by a bimetallic, temperature-responsive disc, which is positioned between the reset pin and switch arm to operate both. A compression spring normally holds the reset pin in a retracted position in the thermostat, when the switch is closed. When the ambient temperature of the thermostat exceeds a predetermined value, the disc snaps against the reset pin to drive it outwardly to an extended position, and to allow the switch to open. The disc can be reset by pushing the pin inwardly when the ambient temperature falls to normal.

3,715,700

AUTOMATIC HEAT DETECTOR

Fred A. Gloeckler, Huntington Valley, Pa., assignor to Star Sprinkler Corporation of Florida, Philadelphia, Pa.

Filed June 17, 1971, Ser. No. 153,956
Int. Cl. H01h *37/76*
U.S. Cl. 337—407 **7 Claims**



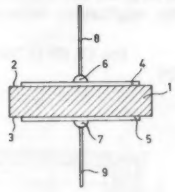
An automatic heat detector is provided which has one or more electric circuits with spring metal contacts and a diaphragm is a closed controlled vented chamber, the contacts being controlled by the expansion of the diaphragm in accordance with rapid temperature rise or by the release of a spring at a predetermined temperature, which spring engages the diaphragm and causes the contacts to move and control the circuits.

3,715,701

NON-LINEAR RESISTANCE ELEMENT

Jean Michel Baudry Ghislain Yperman, Woluwe, and Jean Rodolphe Rapaille, Brussels, both of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,922
Claims priority, application Netherlands, March 5, 1970, 7003118
Int. Cl. H01c *7/10*
U.S. Cl. 338—20 **2 Claims**



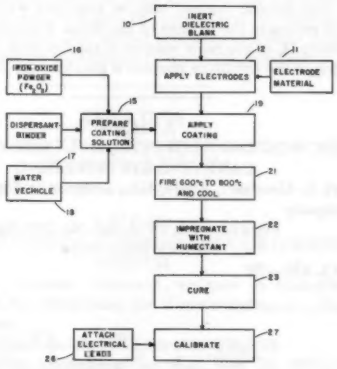
A varistor whose ceramic body contains bismuth oxide and antimony oxide containing semiconducting titanium oxide having a relatively low C-value and a low β value.

3,715,702

RELATIVE HUMIDITY SENSOR

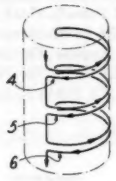
Merle Nicholas, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 23, 1971, Ser. No. 155,987
Int. Cl. H01c *13/00*
U.S. Cl. 338—35 **9 Claims**



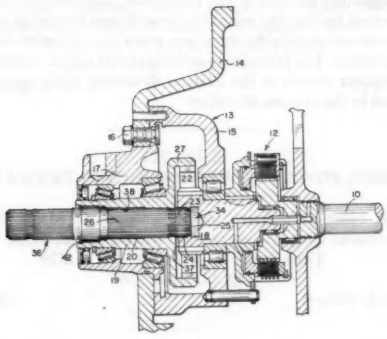
An essentially full range resistance type relative humidity sensing element is produced by providing a dielectric blank, on which an electrode system has been applied, with a metal oxide coating, in a manner which produces a porous structure therein, and subsequently impregnating that coating with a humectant material. The metal oxide used is selected from a group, including oxides of the metals found in Group VIII, Period 4 of the Periodic Table, which exhibit electrical insulating properties, and wherein the amount of electrical resistance varies with the relative humidity of the environment to which it is exposed. The humectant material, which may be any nonvolatile, reversibly hygroscopic material capable of being retained in the porous oxide structure, such as polyethylene glycol, for example, reduces both the amount of electrical resistance and the magnitude of the change in that resistance produced in response to changes in relative humidity into a range readily measured by ordinary electrical resistance measuring devices.

3,715,703
SUPERCONDUCTING SWITCH
Hubert Croso, Ris-Orangis; Gerard Prost, Bagneux; Andre Quefellec, Villeneuve-Saint-Georges, and Jean Sole, Clamart, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France
Filed June 8, 1971, Ser. No. 151,172
Claims priority, application France, June 18, 1970, 7022448
Int. Cl. H01c *7/16*
U.S. Cl. 338—32 S **5 Claims**



The superconducting switch comprises at least one superconducting hairpin element having two arms through which currents pass in opposite directions and the distance *d* between the two arms of a hairpin element is appreciably smaller than the distance D between two adjacent elements.

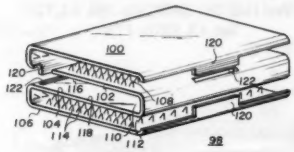
3,715,704
REVERSIBLE POWER TAKE-OFF SHAFT
Ralph C. Boyle, Mountain Home, Ark., and Leonard Paulius, Clarendon Hill, Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Nov. 3, 1971, Ser. No. 195,292
Int. Cl. F16h *37/04*
U.S. Cl. 74—15.4 **8 Claims**



A power take-off shaft having two standard spline ends and a third off centrally located spline set. In conjunction with a multi-speed independent power take-off unit, the single shaft is reversible to provide two different output speeds.

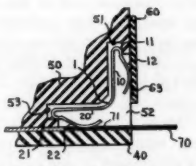
3,715,705
MULTICOMPARTMENT CONNECTOR
Lai Che Kuo, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed March 29, 1971, Ser. No. 129,003
Int. Cl. H01r *11/20*
U.S. Cl. 339—98 **10 Claims**

A uniquely formed, deformable, multicompartment connector having two or more adjacently disposed, independently deformable article receiving portions selectively arranged for intimate engagement about one or more articles disposed therewithin, to provide a secure coupling therebetween. The connector may be suitably formed from electrically conducting material, with locking means and internally disposed teeth,



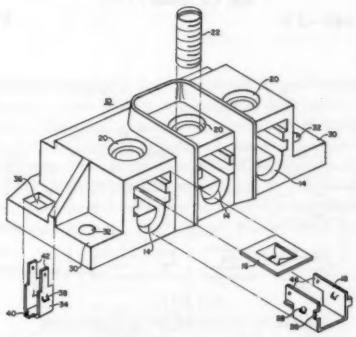
to provide a highly effective electrical connector for use in conjunction with variously configured insulated or noninsulated electrical conductors.

3,715,706
RIGHT ANGLE ELECTRICAL CONNECTOR
Donald E. Michel; Le Roy W. Fairbairn, and James W. Cook, all of Sidney, N.Y., assignors to The Bendix Corporation
Filed Sept. 28, 1971, Ser. No. 184,380
Int. Cl. H01r *13/50;* **H05k** *1/07*
U.S. Cl. 339—156 R **14 Claims**



A right angle electrical connector for connecting in electrical circuit relationship a printed circuit board to a tape cable. The connector contains a plurality of electrical contacts that are retained within the connector by the resilient action of the contact acting against an inside wall of the connector.

3,715,707
TERMINAL BLOCK WITH SNAP-IN COMPONENTS
Melvin R. Anderson, Avon Lake, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed March 16, 1971, Ser. No. 124,854
Int. Cl. H01r *9/00*
U.S. Cl. 339—198 R **9 Claims**

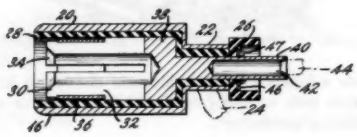


A terminal block assembly for connecting electrical conductors constructed in the form of an insulating plastic block having communicating apertures therethrough and therein. Metal connector members are snap-fitted into the apertures and are releasably retained therein. The metal connector members provide for the positive connection of electrical conductors without the use of soldered, brazed, riveted or mere contact junctures which could cause high resistance locations.

3,715,708
ELECTRICAL CONNECTOR

Richard E. Lloyd, Beltsville, and Linus E. Wallgren, Rockville, both of Md., assignors to Pace, Incorporated, Silver Springs, Md.

Filed Oct. 21, 1970, Ser. No. 82,722
Int. Cl. H01r *17/06*
U.S. Cl. 339—177 E **9 Claims**



An electrical connector adapted for use on a universal cord for electrically powered hand tools, formed as a female assembly and a male assembly both of a coaxial type of construction. The female assembly comprises a central contact, an outer contact and an insulator member therebetween, the members being nested together so that relative movement in one axial direction is prevented. A centrally apertured second insulator bears against the base ends of the outer contact and other insulator. The rearward end of the central contact extends through the aperture. The second insulator which is retained in position by a lock washer serves to prevent relative movement of the components in the other axial direction. The male assembly also has a central contact, an outer contact and an insulator therebetween. The outer contact and insulator have internal shoulders which nest, and the central contact has a flange thereon which seats against the insulator thereby preventing relative movement in one axial direction. The same lock washer retained second insulator arrangement prevents relative movement in the other direction.

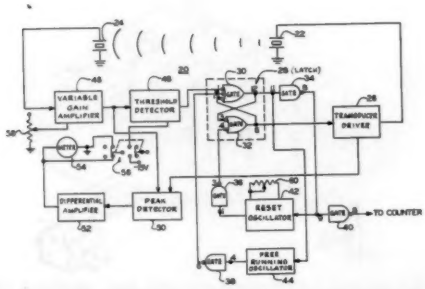
ERRATUM

For Class 340—6 R see:
Patent No. 3,715,577

3,715,709
SING-AROUND VELOCIMETER

Ellis M. Zacharias, Jr., and Uldis Cirulis, both of Paramus, N.J., assignors to Nusonics, Inc., Paramus, N.J.

Continuation-in-part of Ser. No. 853,465, Aug. 27, 1969, abandoned. This application Jan. 14, 1970, Ser. No. 2,719
Int. Cl. H04b *11/00*
U.S. Cl. 340—3 E **17 Claims**



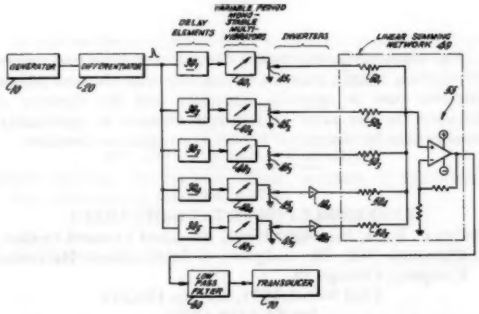
A sing-around velocimeter having a fixed sound path length so that the repetition rate is a function of the velocity of sound in the fluid and consequently of the characteristics of the fluid. A digital latch is employed to control the application of a signal to the transmitting transducer as determined by the signal received by the receiving transducer or by a free running oscillator if no signal is received.

The probe used in the velocimeter has a fixed path length and is shaped so that spurious signals are not received by the receiving transducer. A pair of reflectors and the transducers are mounted in a ring of fixed radius to maintain the path length constant. In one construction, the probe is capable of being inserted in a breaker or similar vessel to measure the characteristics of the contents. A similar construction is used for insertion in a pipe containing flowing fluid to measure the fluid's characteristics.

3,715,710
UNIPOLAR ACOUSTIC PULSE GENERATOR

Julius Bernstein, 166-25 Powells Cove Boulevard, Beechhurt; Sid I. Schildkraut, 22-25 147th Street, Flushing, and John P. Muller, 521 Secatogue Avenue, Farmingdale, all of N.Y.

Filed Nov. 25, 1970, Ser. No. 92,798
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 R **22 Claims**

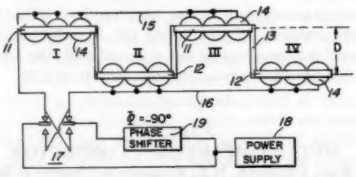


Unipolar acoustic pulses of relatively large amplitude and short duration are formed by driving an electroacoustical transducer with a generally staircase-shaped waveform, advantageously through a low pass filter. The applied waveform is formed by linearly summing constituent electrical pulses of preselected amplitude, duration, polarity, and relative time of occurrence. The transducer driving signal acts to reinforce the transducer output in the desired direction, while opposing its output in the reverse direction.

3,715,711
HIGH POWER, LOW FREQUENCY UNDERWATER TRANSDUCER ARRAY

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Sept. 14, 1970, Ser. No. 71,826
Int. Cl. H04r *1/40*
U.S. Cl. 340—9 **14 Claims**



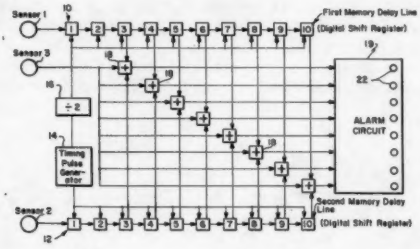
A plurality of underwater transducers are physically mounted in two spaced parallel planes, a quarter wavelength apart. The signals driving the transducers in each of the two planes are electrically displaced from each other by a quarter wavelength. In this way, the sound from the transducers adds on one side of the two planes and cancels on the other side, to provide a unidirectional beam of sonic energy.

3,715,712

INTRUSION DETECTION SYSTEM EMPLOYING TRIPLE COINCIDENCE SPACE-TIME LOGIC

Robert Beagles, Pacific Palisades, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed June 21, 1971, Ser. No. 154,817
Int. Cl. G08b 25/00
U.S. Cl. 340—276 4 Claims



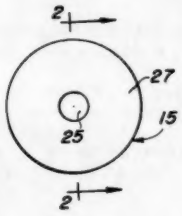
First, second, and third sensors are arranged along a path so that the second sensor is equidistant from the first and third sensors. An intruder passing the first sensor causes a signal to be inserted into a shift register and thence to a coincidence gate. When the intruder passes the second sensor, another signal is inserted into a second shift register and thence into the coincidence gate. The stepping rate of the second shift register is twice that of the first shift register. When the intruder passes the third sensor, a third signal is inserted directly into the coincidence gate, and at that time, the second signal will have caught up with the first signal so that all three signals will be coincident. When all three signals are coincident, an alarm is actuated to indicate the presence of the intruder.

3,715,713

PRESSURE GRADIENT TRANSDUCER

Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Filed Feb. 19, 1970, Ser. No. 12,565
Int. Cl. H04r 17/00; H01v 7/00
U.S. Cl. 340—10 11 Claims



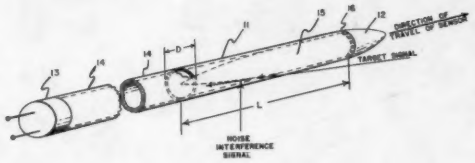
A simple tubular housing structure has a vibratile diaphragm sealing each open end. Each of these diaphragms is mechanically connected to a separate vibratile piston. These pistons are rigidly bonded to the opposite sides of a piezoelectric transducer element assembly. These assemblies generate at least two independent voltages when sound pressure impinges upon the diaphragms. The voltages generated by each of these two piezoelectric plates are combined to effectively neutralize each other when sound pressures of the same amplitude and phase are simultaneously applied to each of the two pistons.

3,715,714

POROUS PIPE ACOUSTIC SENSOR

Tibor G. Horwath, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 23, 1970, Ser. No. 83,560
Int. Cl. H04b 11/00
U.S. Cl. 340—15 5 Claims



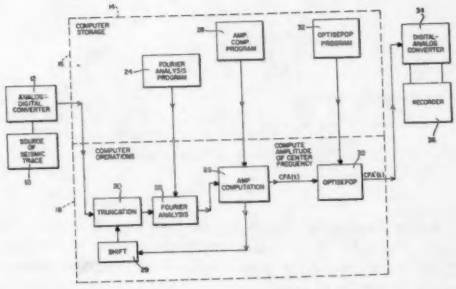
This invention is a dynamic pressure sensor of the porous pipe variety for use in sensing the presence of an acoustic energy source in a moving fluid environment. The sensor is especially adaptable to moving vehicle applications wherein the sensor is located on the moving vehicle and boundary layer interference due to movement of the vehicle and the sensor in air are prime considerations.

3,715,715

APPARATUS FOR AND METHOD OF TREATING SEISMIC DATA TO OBTAIN A WIDE BAND REPRESENTATION

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation

Filed Oct. 30, 1970, Ser. No. 85,630
Int. Cl. G01v 1/36
U.S. Cl. 340—15.5 DP 7 Claims



A computer apparatus for and computer performed method of obtaining a wide band representation of seismic reflection amplitudes. The seismic trace is successively truncated, each of the successive truncations is successively Fourier analyzed, and each center frequency component amplitude of the successive Fourier analyses is computed. The effects of successive truncation on the resulting center frequency function are then removed through the use of an optimum separation operator.

3,715,716

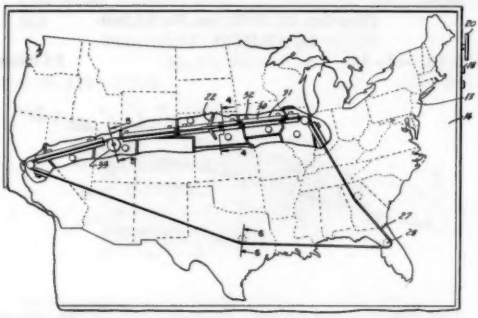
PROGRESSIVE DISPLAY SCREEN

Jean R. Stiegemeier, 559 Andes Ave., Orlando, Fla.

Filed May 13, 1970, Ser. No. 36,784
Int. Cl. G08g 1/12
U.S. Cl. 340—23 10 Claims

A progressive display screen apparatus for indicating the position of a vehicle in which a flexible guide located behind the screen guides an indicator which indicates where the vehi-

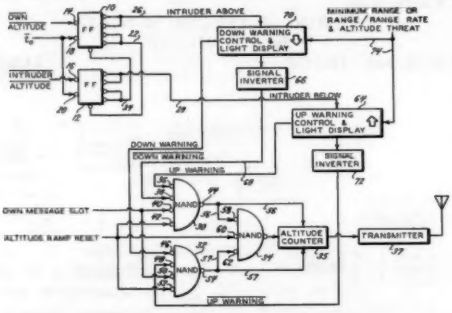
cle is located with respect to a referenced map which may be on the screen or a separate topographical map located behind the screen. A variable speed motor, or the like, drives the indicator at a speed analagous to the speed of the vehicle and lights may be provided to illuminate various locations or sections of the map.



3,715,717
MEANS FOR HANDLING ALTITUDE INFORMATION IN COLLISION AVOIDANCE SYSTEMS

Robert E. Perkinson, St. Louis County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 12, 1970, Ser. No. 10,907
Int. Cl. G08g *5/04*
U.S. Cl. 340—27 R **11 Claims**



An apparatus for improving the handling of altitude information in collision avoidance systems and the like including means to minimize the possibility that a command maneuver to climb or dive to avoid being on a collision course will cause the involved aircraft to fly through each others altitude, said apparatus also including means to improve the reporting of altitude information in collision avoidance systems so that actual as well as shifted altitude information will be transmitted when a maneuver is commanded to forewarn other aircraft of possible dangerous situations developing as a result of the maneuver.

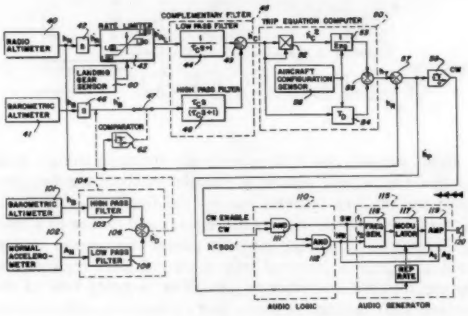
3,715,718
GROUND PROXIMITY WARNING SYSTEM UTILIZING RADIO AND BAROMETRIC ALTIMETER COMBINATION

Ralph A. Astengo, Redmond, Wash., assignor to Sundstrand Data Control, Inc.

Filed Aug. 11, 1970, Ser. No. 62,861
Int. Cl. G01c *5/00*
U.S. Cl. 340—27 R **17 Claims**

A ground proximity warning system for an aircraft which produces a warning signal when the rate of descent of the aircraft exceeds a limiting value determined by the aircraft altitude. The rate of descent of the aircraft is calculated from a combination of measurements of the altitude of the aircraft above ground and the barometric altitude of the aircraft. A signal representing the rate of change of the altitude of the aircraft above ground is limited, to minimize false warnings as a result of surface irregularities. The barometric portion of the system is disabled during take-off run and the initial portion of the aircraft climb-out to avoid a false warning resulting from an increased barometric pressure condition during this maneuver. The limits on the aircraft altitude rate signal are modified in accordance with the flight mode of the aircraft, to reduce the sensitivity of the warning system during the final stage of a landing approach.

The warning system provides an alarm to the pilot which is an audio tone modulated at a low frequency repetition rate. A



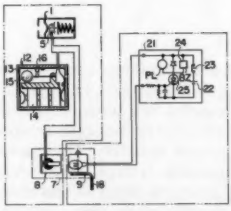
soft warning is actuated when the sink rate of the aircraft exceeds a desired level for the altitude at which the aircraft is operating. If the aircraft is also below a limiting altitude, a hard warn signal is provided. The repetition rate of the warning signal, while in a soft warn condition, is a function of the difference between the altitude of the aircraft and the altitude at which the sink rate would be proper.

A complementary filter with which the altitude rate signals are combined, includes an operational amplifier connected in an unloading amplifier configuration with a resistive circuit connecting one input signal with the amplifier and a capacitive circuit connecting the other input signal with the amplifier, the resistive and capacitive input circuits forming a low pass filter for the first signal and a high pass filter for the second signal.

3,715,719
TIRE PRESSURE INDICATION SYSTEM

Uichiro Sugiyama, 21-10, Zenpukuji 1-chome, Suginami-ku, Tokyo, Japan

Filed Feb. 10, 1971, Ser. No. 114,180
Claims priority, application Japan, March 3, 1970, 45/20261; March 3, 1970, 45/20262; April 6, 1970, 45/20263; Nov. 4, 1970, 45/108908
Int. Cl. B60c *23/04*
U.S. Cl. 340—58 **2 Claims**



An air pressure responsive electric switch is mounted on a rotatable tire and wheel assembly of a vehicle and is subjected

to the tire internal pressure. A magnetically actuated switch is mounted on a non-rotatable component of the vehicle, such as a brake mounting plate. A magnet is mounted on the tire and wheel assembly for rotation in a plane adjacent the magnetically actuated switch and is caused to operate the latter switch when the pressure responsive switch is operated responsive to a predetermined decrease in the tire pressure. The magnet may be an electromagnet whose energization is controlled by the pressure responsive switch, or it may be a permanent magnet normally retracted from operative relation with the magnetically actuated switch and moved to an operative position by the pressure responsive switch upon a predetermined decrease in the tire pressure. The magnetically actuated switch controls the activation of an indicating unit including an audible and visual alarm positioned in the driver's compartment of the vehicle, and the control circuit for the indicating unit includes a thyristor, such as an SCR, whose gating is controlled by the magnetically actuated switch. The units mounted on the tire and wheel assembly and on the brake drum may be encased in an epoxy resin for protection against ambient conditions.

3,715,720

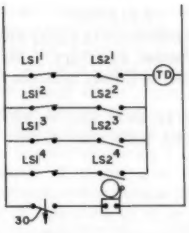
APPARATUS FOR DETERMINING AN UNDERINFLATED CONDITION IN PNEUMATIC TIRES

Frederick S. Jehle, 517 East 25th, Hutchinson, Kans.

Filed Feb. 25, 1971, Ser. No. 118,825

Int. Cl. B60c *23/00*; **G08b** *13/10*

U.S. Cl. 340—58 **5 Claims**



A device for detecting a flat or underinflated condition in a pneumatic vehicle tire as the tire traverses the device. The rod end of a ram serves as a probe mounted in the path of the vehicle tire and is biased into engagement with the tire by a predetermined force maintained in the ram through a regulated pressure circuit. A tire having adequate air pressure will exert sufficient downward force to overcome the biasing force and cause the rod to depress. An associated signal circuit is controlled by limit switches actuated by rod movement. Depression of the rod permits the switched circuit to remain inactive. Failure of the rod to depress the tire as it passes across the rod causes the circuit to actuate an appropriate signal.

3,715,721

VEHICLE STATION KEEPING DEVICE

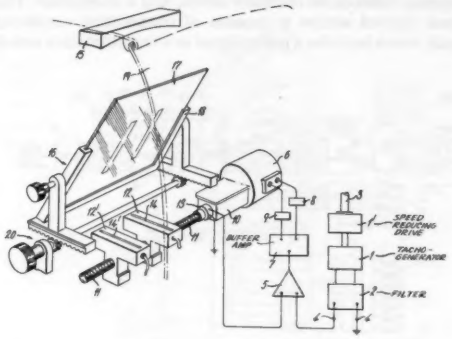
Alexander Irving, Farnborough, and Reginald Alfred Francis Priest, Crowthorne, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 23, 1971, Ser. No. 118,037

Int. Cl. B60q *1/00*

U.S. Cl. 340—62 **12 Claims**

A vehicle station keeping device provided in which the images of two fiducial marks are projected to infinity so that they can be viewed by the driver of the vehicle. The marks can be moved either continuously or in discrete steps so that the



spacing between the marks is proportional to the vehicle's speed.

3,715,722

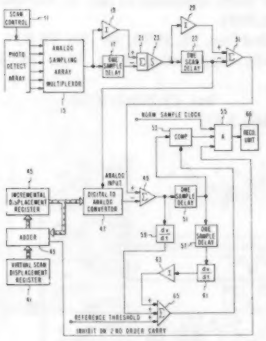
DATA NORMALIZATION SYSTEM

Richard E. Hall, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1971, Ser. No. 159,285

Int. Cl. G06r *9/00*

U.S. Cl. 340—146.3 H **11 Claims**



A data normalization system including sampling of interpolation functions generated from original fixed pitch data samples. The accuracy of digital data generated from the interpolation function is increased by modulating the binary discrimination threshold.

3,715,723

FREQUENCY DIVISION MULTIPLEX TECHNIQUE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration in respect to an invention of, and Hans Brey, Route 1, Box 88, Huntsville, Ala.

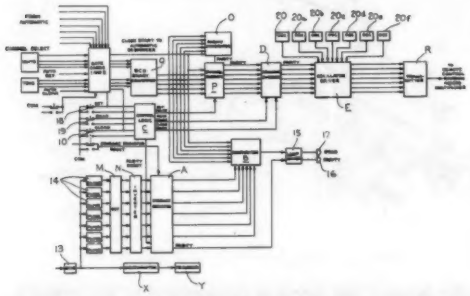
Filed Dec. 28, 1971, Ser. No. 212,921

Int. Cl. G08b *25/00*; **G08c** *25/00*

U.S. Cl. 340—146.1 C **4 Claims**

A system for monitoring a plurality of condition responsive devices. It consists of a master control station and a remote station. The master control station includes a channel select means, a BCD to binary converter, a parity generator, a storage register, a comparator, a plurality of sources of identifying frequencies, an oscillator driver, and a transmitter. The remote station includes a bank of filters for separating the transmitted signals, a detector, a driver, a parity correlator, a

command verification and command reset circuit, a storage register, a random access multiplexer, a plurality of identifying frequency sources, an oscillator driver, and a transmitter. The master control station is capable of transmitting command signals which includes a parity signal to a remote station which



transmits the signals back to the command station so that such can be compared with the original signals in order to determine if there are any transmission errors. The system utilizes frequency sources which are 1.21 multiples of each other so that no linear combination of any harmonics will interfere with another frequency.

3,715,724

APPARATUS FOR RECOGNIZING GRAPHIC SYMBOLS

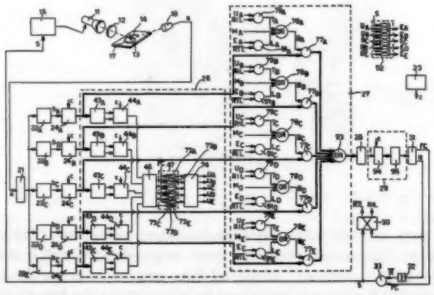
Filippo Demonte, Borgofranco D'Ivrea, and Luciano Pipino, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C.S.p.A., Ivrea (Turin), Italy

Filed Dec. 10, 1970, Ser. No. 96,931

Claims priority, application Italy, Dec. 24, 1969, 54500 A/69

Int. Cl. G06k *9/00*

U.S. Cl. 340—146.3 AG **10 Claims**



An optical character recognition device is disclosed wherein a character is scanned by a cathode ray tube along a plurality of parallel scan lines and a photo-detector derives an analogue electrical signal proportional to the intensity of the light signal output from each scanned point. The derived analogue signals are compared with a plurality of threshold values, and an optimum threshold is selected. The resulting digital signal is then compared with pre-established graphic signals to provide a recognition symbol identifying the character. Means are also provided to command a re-examination of an unrecognized signal by selecting a different threshold value. A logical filter apparatus is also provided to operate on the binary value assigned to the point under examination and the surrounding points and to assign to the examined point a binary signal level depending at least in part on the signal levels of the surrounding points. This logic filter circuit also includes means for detecting end points in lines and for detecting and eliminating break points in lines by comparing signal bits corresponding to the points surrounding the point examined to a pre-established set of conditions.

3,715,725

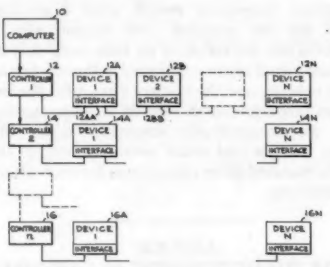
ADDRESS RESPONSIVE CONTROLLER FOR COMPUTER HANDLING OF PERIPHERAL EQUIPMENT

James M. Kievit, Des Plaines, and James L. Howe, Chicago, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,241

Int. Cl. H04q *5/00, 9/00, 11/00*

U.S. Cl. 340—147 **9 Claims**



A system is provided for enabling a computer to communicate efficiently with a larger number of peripheral devices than provided for by the computer design and construction. The computer first addresses a controller which in turn addresses peripheral devices.

3,715,726

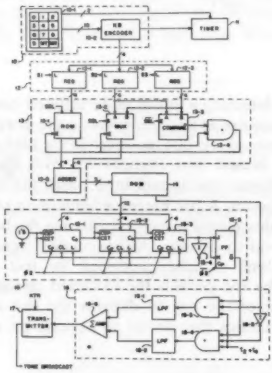
SELECTIVE TONE SIGNALLING APPARATUS

Gary P. Wallin, Manchester, and Gary N. Stapleford, Nashua, both of N.H., assignors to Comex Systems, Inc., Manchester, N.H.

Filed Sept. 16, 1971, Ser. No. 181,165

Int. Cl. H03k *1/00, 21/36*

U.S. Cl. 340—171 PF **10 Claims**

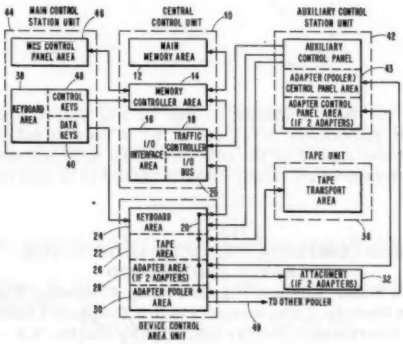


Sequential tone generator useful in paging applications. Three digit call numbers are entered into a register for temporary storage from an input device. Values indicative of the tones in the tone repertoire are stored in a first memory. Encoder values indicative of a desired tone encoding scheme are stored in a second memory. The stored call number is employed to address the encoder values of the second memory and to modify them so as to form the first memory addresses of the tone values specified by the call number. The addressed tone values are employed as divisor values in a frequency divider network to generate the tones.

3,715,727
CONTROL MECHANISM AND BUS FOR A DATA PROCESSING POOLER SYSTEM

Frank K. Yu, Burlington, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed June 11, 1970, Ser. No. 45,523
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **25 Claims**



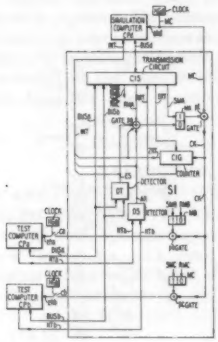
An improved data processing pooler system for pooling data cooperatively to a central computer compatible magnetic tape or tapes from other computer compatible magnetic tape or tapes, utilizing key-to-tape units, each key-to-tape unit having device-control-area (DCA) units as an interface between said key-to-tape units, said DCA's being coupled to each other by a pooler bus of the "hand shake" type having a plurality of bidirectional lines for transmitting or receiving control and/or data signals. The system comprises input/output devices of the key-to-tape type, one device having a master pooler adapter and controls capable of operating as the master or control pooler unit, whereas the other devices have a slave pooler and controls capable of operating as slave or controlled pooler unit(s). An input/output (I/O) bus connects a central processor (CCU or CPU) unit in each key-to-tape unit with the device-control-area (DCA) also in each key-to-tape unit; said I/O bus contains a group of bi-directional multifunction lines, single function lines and a second group of control lines which form an array. Sending key-to-tape units and receiving key-to-tape units, each individually having its own memory, are connected by a pooler bus, and interfaced via the key-to-tape device-control areas (DCA's) which contain the necessary logic to link the sending and receiving pooler adapters together, and to provide the control of information flow to and/or from the respective sending and receiving memories. Additional logic circuitry write and/or read information into or out of said memories and onto or out of the magnetic tapes.

3,715,728
SIMULATION TIMING CONTROL SYSTEM

Bernard J. Fontaine, Ris-Orangis, and Alonso Gabriel, Antony, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 10, 1970, Ser. No. 53,746
Claims priority, application France, July 24, 1969, 6925251
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **2 Claims**

The simulation of real time program within computer systems such as telephone switching systems is accomplished by performing the program under the control of a timing clock without direct relation to the real time. A timing indicator is

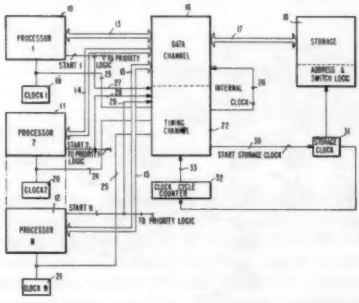


used to follow the progress of the program, the indicator being settable to control the duration of the test programs.

3,715,729
TIMING CONTROL FOR A MULTIPROCESSOR SYSTEM

Brian R. Mercy, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed March 10, 1971, Ser. No. 122,893
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **10 Claims**



A multiprocessor system has plural autonomous digital data processors operable to communicate individually with a common storage system. Each processor has its own clock. The timing control means selectively uses any one of the individual processor clocks for timing the communication of its or any other processor with the common storage system.

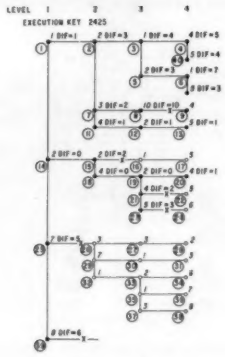
3,715,730
MULTI-CRITERIA SEARCH PROCEDURE FOR TRAINABLE PROCESSORS

Stanley L. Smith, Richardson; William C. Choate, Dallas, and Michael K. Masten, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1970, Ser. No. 42,431
Int. Cl. G06f *15/40*
U.S. Cl. 340—172.5 **8 Claims**

In the execution mode of a trained processor, query key functions are compared with reference key functions stored in a memory array to select a desired response. During the comparison operation, a criterion is imposed to indicate when reference key functions corresponding to a given group of trained responses can not be an appropriate response for an encountered untrained point, wherein an untrained point is a

query key for which no corresponding reference key exists. In response, search of some stored reference key functions is waived. In the multi-criteria search procedure of this invention a plurality of criteria may be imposed in an expanded search operation to waive search of specific stored reference key functions.

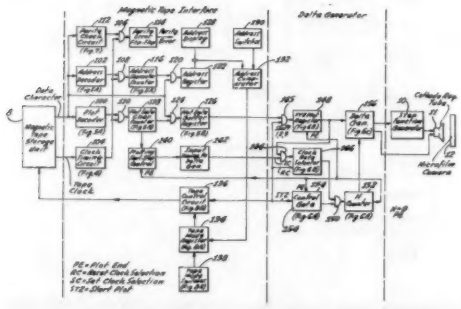


3,715,731

MICROFILM PLOTTER SYSTEM

Philip T. Kan, Reseda, Calif., assignor to Computer Industries, Inc., Van Nuys, Calif.

Filed March 16, 1970, Ser. No. 19,589
Int. Cl. G06f *9/00*; G05b *19/18*
U.S. Cl. 340—172.5 **5 Claims**



The present invention relates to an improved digital incremental plotter system of the microfilm type, and it relates more particularly to such a system in which information to be plotted and recorded on microfilm may be derived from an associated digital computer in the form of a series of instructions, either directly on-line, or in an off-line system from punched cards, punched paper tape, magnetic tape, or the like.

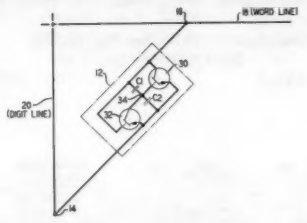
3,715,732

TWO-TERMINAL NPN-PNP TRANSISTOR MEMORY CELL

Dennis Joseph Lynes, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 9, 1971, Ser. No. 206,272
Int. Cl. G11c *11/40*, *11/24*
U.S. Cl. 340—173 R **5 Claims**

A semiconductor memory array contains memory cells each of which contains an NPN transistor and a PNP transistor. The collector and base of the NPN transistor are respectively coupled to the base and collector of the PNP transistor. Bit information is written into the cell by causing or inhibiting conduction in the PNP transistor in order to set the potential of the base of the NPN transistor to one of two values which represent, respectively, a "1" and a "0." A positive polarity voltage pulse applied to the collector of the NPN transistor causes information previously stored in the cell to be read out.

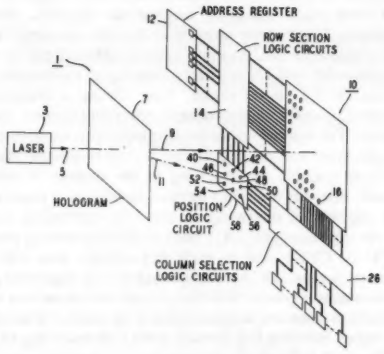


3,715,733

ERROR COMPENSATING OPTICAL DETECTOR APPARATUS AND METHOD

Alexander Feiner, Rumson, N.J., and Philip A. Harding, Palos Verdes Penisula, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 11, 1972, Ser. No. 225,515
Int. Cl. G11c *13/04*; G11b *27/10*
U.S. Cl. 340—173 LM **19 Claims**



An optical memory system comprises a laser light beam that illuminates a hologram, which contains stored bit and position information, in order to produce a position light beam and signal light beams, which are imaged respectively on an array of position detectors and an array of information detectors. Any misregistration of the laser light beam causes the position detectors to generate an error signal which is used to correct the outputs of the information detectors.

3,715,734

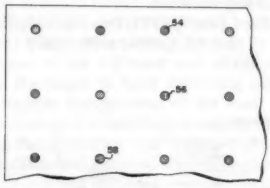
MEMORY STORAGE DEVICE AND METHOD OF MAKING THE SAME

Jack Fajans, 1133 Magnolia Road, Teaneck, N.J.

Continuation-in-part of Ser. No. 871,573, Oct. 10, 1969, abandoned, and a continuation of Ser. No. 599,608, Dec. 6, 1966, abandoned. This application Nov. 12, 1970, Ser. No. 89,114
Int. Cl. G11c *13/04*
U.S. Cl. 340—173 LM **10 Claims**

A three-dimensional memory storage unit is prepared by carbonizing selected spots in a block of polymethylmethacrylate by means of a steeply converging laser beam. The energy

of the beam is applied in pulses of such duration and at such intensity that carbonization takes place only at the focal point of the beam and in the immediate vicinity of the focal point while the radiant energy at a small distance from the focal



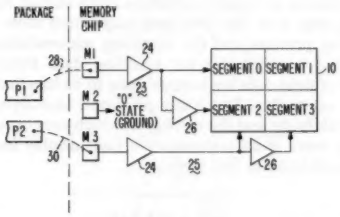
point is too widely distributed to cause carbonization. By shifting the block between pulses, a three-dimensional network of black, opaque spots is produced. The device is read by an optical system having a wide-angle objective lens.

3,715,735

SEGMENTIZED MEMORY MODULE AND METHOD OF MAKING SAME

William E. Moss, Sunnyvale, Calif., assignor to Monolithic Memories, Inc.

Filed Dec. 14, 1970, Ser. No. 97,586
Int. Cl. G11c *7/00, 17/00*
U.S. Cl. 340—173 R **16 Claims**



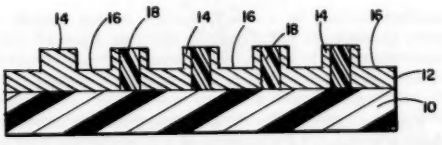
A method of utilizing a memory array or module containing inoperative memory cells or bits is accomplished by electrically segmentizing the memory module and then permanently isolating the segment(s) containing inoperative bits to form a segmentized but functional memory module. This is accomplished by forcing the address means associated with the segment(s) containing inoperative bits to a permanent, single binary state which is inconsistent with the binary address codes for the memory cells in the segment(s) containing the inoperative bits.

3,715,736

MAGNETIC BUBBLE DOMAIN SYSTEM

Cedric F. O'Donnell, Fullerton, and George R. Pulliam, Anaheim, both of Calif., assignors to North American Rockwell Corporation

Filed April 1, 1971, Ser. No. 130,128
Int. Cl. G11c *5/02, 11/14*
U.S. Cl. 340—174 TF **12 Claims**



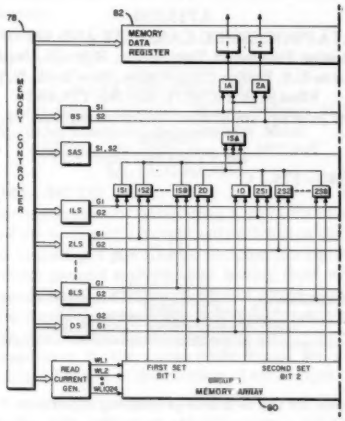
A magnetic bubble domain system having localized areas of spatial stability for bubble domains is disclosed. The bubble domain system includes a thin film of single crystal magnetic bubble domain material on a single crystal substrate. The film has a plurality of isolated thick portions surrounded by thinner regions. The bubble domains when formed preferentially move into the thick portions. The surrounding relatively thin regions of film serve as energy barriers to the movement of the bubble domains and confine the bubble domains in the relatively thick portions of the film. Bubble domains may be moved to and from the thick portions in a plurality of directions.

3,715,737

MEMORY ARRAY READOUT WITH LEADING AND TRAILING EDGES OF THE READ SIGNAL

Gary L. Grundy, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 810,153, March 25, 1969, abandoned. This application May 6, 1971, Ser. No. 141,038
Int. Cl. G11c *7/00, 11/14*
U.S. Cl. 340—174 M **4 Claims**



A scheme for reading out the information content of a memory array on the leading and trailing edges of a unipolar read signal. The sense lines of two memory elements that are simultaneously affected by the read signal couple their associated output signals through associated output gates to a single gated sense amplifier. The output signals are, in turn, coupled to associated different portions of a memory register through associated sense amplifier output gates. The read signal causes the two memory elements to generate associated output signals at both its leading and trailing edges. By properly gating the output signals at the associated output gates at, alternatively, the times of the read signal leading and trailing edges, the information associated with each of the two memory elements is stored in the associated different portions of the memory register.

3,715,738

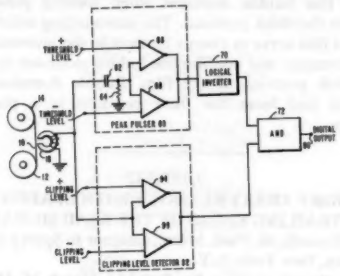
DATA DETECTION SYSTEM

Robert A. Kleist, and Robert L. Thorne, both of Anaheim, Calif., assignors to Peripheral Business Equipment, Inc.

Filed Oct. 19, 1970, Ser. No. 81,989
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1 H **9 Claims**

A data detection system is disclosed in which digital data bits represented by flux transitions on a magnetic medium produce peaks in a signal sensed by a magnetic read head as the magnetic medium moves relative to the read head. The sensed signal is passed to a peak pulser where the signal is differentiated and thereafter compared with positive and negative threshold levels to produce a data pulse corresponding to

each peak of the sensed signal. The sensed signal is also passed to a clipping level detector where it is compared with positive and negative clipping levels to produce a gating pulse when



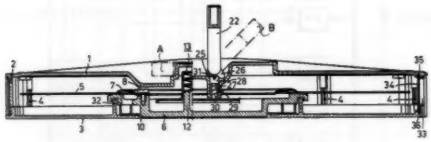
the clipping levels are exceeded. The gating pulses are employed to selectively gate the data pulses to an output as the detected data.

3,715,739

DATA PROCESSING CASSETTE AND SPINDLE

Paul Antonius Ferdinand Van Acker, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 10, 1971, Ser. No. 179,462
Claims priority, application Netherlands, Sept. 24, 1970, 70/4068
Int. Cl. G11b *23/04*
U.S. Cl. 340—174.1 C **9 Claims**



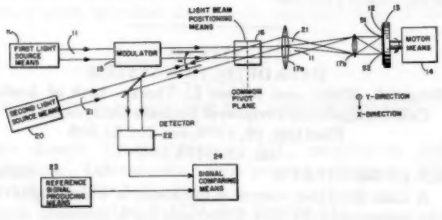
A cassette for use in a data processing apparatus, which cassette contains a magnetizable recording disc which is supported by a support provided with a central bore by means of which the cassette may be placed on the driving spindle of the apparatus. The cassette is provided with a clamping device in the form of a collet by means of which the cassette may be clamped and which is adapted to be operated by a handle hingedly connected to the cassette.

3,715,740

OPTICAL MASS MEMORY

Francis M. Schmit, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 30, 1971, Ser. No. 176,158
Int. Cl. G11b *5/02*; **H01v** *3/04*
U.S. Cl. 340—174.1 M **4 Claims**



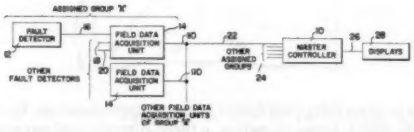
An optical mass memory of the Curie point writing type includes a separate read-out beam for checking written bits within fractions of microseconds after storage to ensure that the magnetization direction of the bit was properly stored.

3,715,741

AIRPORT LIGHTING MONITORING SYSTEM AND SYSTEM COMPONENTS

John E. McWade, Media; Jan Keizer, Brookhaven; Wilcy I. Moore, Folsom, and Ernest M. Purcell, Swarthmore, all of Pa., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Feb. 9, 1971, Ser. No. 113,821
Int. Cl. G08b *21/00, 26/00*
U.S. Cl. 340—251 **22 Claims**



A monitoring system is provided for airport lighting installations employing series connected incandescent lamps. For each lamp there is a fault detector unit with voltage and overcurrent relays supplying an output whenever lamp current or voltage is deficient. There is also a fault detector for supplying an output when output current of a current regulator deviates from the value for which the lamp-current regulator is set.

The lamps are divided into groups and for each group there is a field data acquisition unit. The field data acquisition units in turn, are connected in groups to a master controller with an output to suitable fault-indicating displays to warn of unsafe conditions.

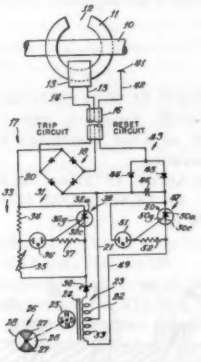
The master controller includes a clock circuit, logic for converting data from the field data acquisition units to form for actuating printers and for actuating accumulative fault display, and a sequencer for enabling data from successive groups of field data acquisition units to be handled by a single master controller. There is a print-out, identifying lamp circuits with faults and the runway in which they occur. For each runway there is an accumulative fault display indicating the number of faults in that runway.

3,715,742

ALTERNATING CURRENT FAULT INDICATING MEANS

Edmund O. Schweitzer, Jr., Northbrook, Ill., assignor to E. O. Schweiter Manufacturing Co., Inc., Mundelein, Ill.

Filed June 1, 1971, Ser. No. 148,440
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 A **17 Claims**



Fault current flow in an alternating current carrying conductor is shown by operation of a target to fault indicating position from which it is restored in response to the energizing voltage of the conductor. A C-shaped magnetic core embraces

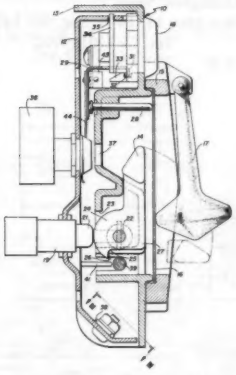
the conductor and has a winding thereon the output of which is rectified and, when it reaches a predetermined value, is applied to a trip winding of a fault indicator to operate the target. A reset winding of the fault indicator is energized from a capacitor that is charged from the conductor voltage a source of which may be obtained from a capacitor plate embedded in the insulation of a conductor terminator. In a modification alternating current is applied to the trip winding to demagnetize the magnetic core of the indicator and allows a permanent magnet to bias the target to fault indicating position. Other modifications include energization of the reset circuit from the secondary winding of a distribution transformer, provision for magnetizing the distal ends of a U-shaped yoke embracing a conductor carrying fault current, and application of the yoke to the conductor of a pad mounted switching arrangement for a transformer.

3,715,743

FIRE ALARM SIGNALLING APPARATUS

Howard P. Denton, Gardner, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass.

Filed Oct. 26, 1970, Ser. No. 83,929
Int. Cl. G08b *25/00*
U.S. Cl. 340—303 **7 Claims**



This invention relates to a fire alarm system and, more particularly, to an apparatus for fire alarm signaling, having an alarm actuator enclosed within a glass window and operated upon actuation to break a replaceable glass rod, including means to prevent the actuating lever from being re-set by other than authorized persons.

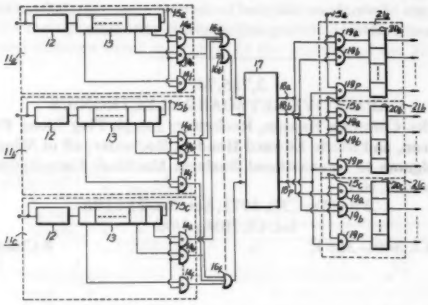
3,715,744

GRAPHIC SYMBOL DISPLAY SYSTEM INCLUDING PLURAL STORAGE MEANS AND SHARED SIGNAL CONVERTER

Takamasa Ito, Tokyo, and Tsutomu Makino, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 15, 1970, Ser. No. 80,947
Claims priority, application Japan, Oct. 16, 1969, 45/82794
Int. Cl. G09f *9/32*
U.S. Cl. 340—336 **7 Claims**

A display system with a plurality of electric indicator devices having a plurality of circuits for memorizing binary digit signals supplied thereto, the number of such memorizing circuits corresponding to that of the indicator devices. Included is a circuit common to all the memorizing circuits for converting the memorized binary digit signals into code signals for display. Circuits are provided for applying the binary digit signals from each of the memorizing circuits to the converting circuit sequentially in a time divisional manner. A plurality of circuits is connected between the converting circuit and the indicator devices, respectively, each of the last-mentioned circuits being supplied with the code signals from the converting circuits in a time divisional manner to



memorize them and to apply them to the respective indicator device. The system also includes a circuit for activating the indicator devices.

3,715,745

DATA INPUT ENCODER

Genio R. Arciprete, Lexington, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Dec. 29, 1970, Ser. No. 102,365
Int. Cl. G06f *3/00*
U.S. Cl. 340—347 DD **13 Claims**

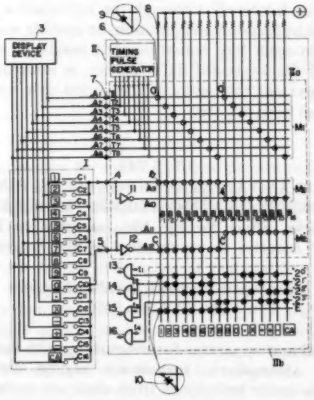
Encoder apparatus for generating a plurality of pulses indicative of the setting of a plurality of switches or the like, said apparatus including a plurality of switches having their common contacts ganged together and having their wiper arms coupled to different gating circuits, said gating circuits being actuated in a predetermined sequence to generate signals having a width proportional to the position of each wiper arm, and means responsive to the pulse width signal for generating pulse signals indicative of the position of each wiper arm.

3,715,746

KEYBOARD INPUT DEVICE

Isao Hatano, Kyoto-fu, Japan, assignor to Omron Tateisi Electronics, Co., Kyoto, Japan

Filed March 10, 1971, Ser. No. 122,667
Int. Cl. H04q *3/00*
U.S. Cl. 340—365 S **11 Claims**



An input device comprising a keyboard circuit arrangement and an input signal converting circuit unit wherein junction

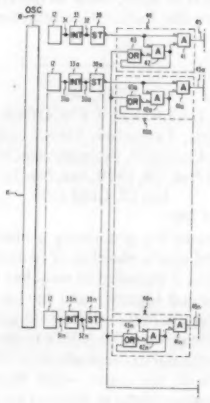
terminals therebetween are advantageously reduced to a small number. To this end, the key contacts disposed in the keyboard are divided into a plurality of groups according to the number of timing pulses employed while the signal converting circuit unit is constructed with a plurality of matrices, portions of which are adapted to receive input signals from the keyboard through corresponding group terminals.

3,715,747

CAPACITIVE KEYBOARD ELECTRONICS

Charles Christian Hanson, Rochester; Joseph Ping Liong Ho, Byron, and Merle Edward Houdek, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,196
Int. Cl. H04q *3/00*
U.S. Cl. 340—365 E **8 Claims**



In a keyboard, key actuation causes a signal to be coupled from a drive pad to a sense pad. The output from the sense pad is connected to the encoder by a switching circuit. The encoder output goes to both the keyboard data register and through a delay circuit to set a latch which interrupts the switching circuit that was initiated by key depression. Effectively the elapsed time of the delay circuit represents the duration of coupling between the circuit of a depressed key and the data register through the encoding circuits. An overrun condition causes the transmission from encoder to keyboard data register to be inhibited. Although the keyboard is not physically locked by an overrun condition, an audible sound, which occurs upon each key actuation that results in data being received by the keyboard data register, is interrupted to inform the operator that entry of the coded data into such register has not been effected.

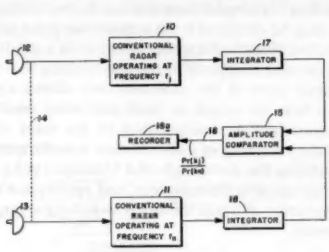
3,715,748

METHOD AND APPARATUS FOR MEASURING THE INTENSITY OF ATMOSPHERIC TURBULENCE

John J. Hicks, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 30, 1971, Ser. No. 139,069
Int. Cl. G01s *9/00*
U.S. Cl. 343—5 W **4 Claims**

A method and apparatus for measuring, with radar, the intensity of atmospheric turbulence and/or distinguishing between the radar reflections from clear air turbulence and those produced either by clouds or by the occurrence of a large vertical gradient in radar refractivity. Two or more conventional microwave radars operated simultaneously at different preselected frequencies, transmit and receive reflected energy from a selected atmospheric volume. The received signals are processed to obtain a comparison of the signal amplitudes or intensities from the radars and the data derived



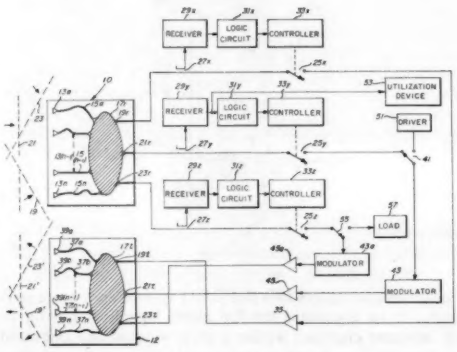
from this comparison is utilized to indicate the intensity of detected clear air turbulence and to distinguish such turbulence from other atmospheric phenomena; e.g., clouds, etc. which also produce radar reflections.

3,715,749

MULTI-BEAM RADIO FREQUENCY SYSTEM

Donald H. Archer, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed May 11, 1971, Ser. No. 142,224
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 R **4 Claims**



A transmitting/receiving system for radio frequency energy is shown, such system incorporating a multi-beam array antenna and appropriate control circuitry to adapt the system to operation simultaneously as a radar, as a relay or as a transponder.

3,715,750

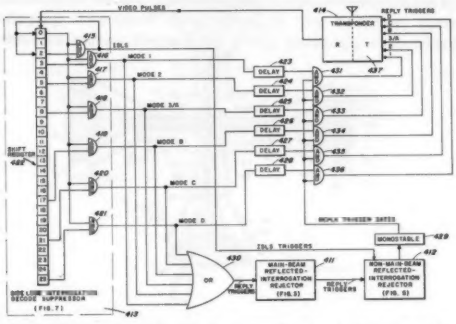
OMNIDIRECTIONAL REFLECTED INTERROGATION REJECTOR

Walton B. Bishop, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 31, 1970, Ser. No. 60,009
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.8 LC **4 Claims**

This application describes a way in which radar-beacon transponders can be made to reject nearly all of the reflected interrogations that reach them without rejecting direct-path interrogations unless two or more interrogators operating on the same interrogation-repetition frequency interrogate a particular transponder simultaneously. Logic circuits are provided to show how the IFF Mark X (SIF), also known as the Air Traffic Control Radar Beacon System (ATCRBS) or the Secondary Surveillance Radar (SSR), can be modified to

make use of the new technique. Classified military systems can use it equally well if suitable modifications are made. A circuit is also provided to suppress sidelobe-interrogation decoding



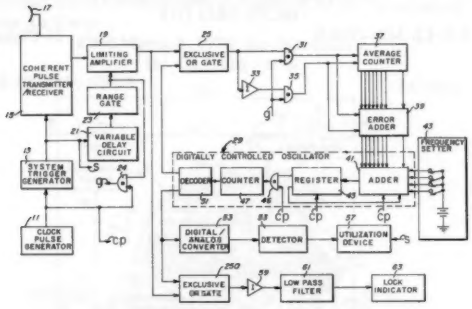
instantaneously so that the transponder dead time, no longer needed when reflected interrogations are rejected, can be eliminated.

3,715,751

DIGITAL SPEED GATE FOR DOPPLER RADAR

George S. Mead, Maynard, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 30, 1970, Ser. No. 76,954
Int. Cl. G01s 9/44
U.S. Cl. 343—7 A **4 Claims**



A speed gate for a pulse Doppler or CW Doppler radar wherein a signal being tracked is fed, along with a signal from a digitally controlled oscillator, to an exclusive OR gate ro derive gating signals for clock pulses. such gated clock signals are then used to actuate an up-down counter to derive a digital number indicative of the average phase difference between the signal being tracked and the digitally controlled oscillator. Such number is combined with a digital number indicative of the phase difference, measured by the gated clock signals over a relatively short period, between the signal being tracked and the signal out of the digitally controlled oscillator to produce a digital correction signal for the digitally controlled oscillator to change the phase thereof until a phase lock condition occurs between the signals into the exclusive OR gate.

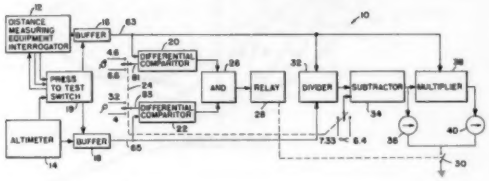
3,715,752

STRUCTURE FOR AND METHOD OF AIRCRAFT GUIDANCE

Patrick H. Garrett, Athens, Ohio, assignor to The President and Board of Trustees of Ohio University, Athens, Ohio

Filed Jan. 26, 1970, Ser. No. 5,771
Int. Cl. G01s 9/14
U.S. Cl. 343—7.3 **14 Claims**

A vertical guidance system for providing a glide-path for aircraft. An aircraft slant-range signal from a known distance-measuring equipment interrogator is divided by an aircraft altitude signal from known altitude-measuring equipment to provide a true aircraft glide angle, and the true aircraft glide angle is subtracted from a reference aircraft glide angle which determines a reference glidepath to provide an aircraft glide angle error signal in degrees. The glide angle error signal is then multiplied by the slant-range signal to provide a vertical lineal distance error indication of the position of the aircraft



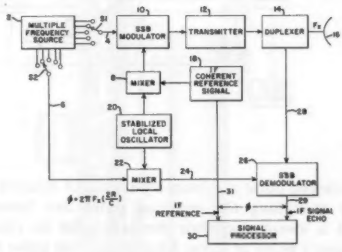
relative to the reference glidepath. Structure is also disclosed for electronically compensating for offsetting the usual distance-measuring equipment from a desired aircraft touchdown point. The altitude signal is compensated for variations in field altitude and barometric pressures and in one modification may be synchronized with the pilot's altimeter. Aircraft arrival at a letdown-initiation point is visually indicated by the disclosed guidance system.

3,715,753

COHERENT RANGE AND LENGTH RESOLUTION

Sidney P. Applebaum, Liverpool, and Bernard H. Geyer, Jr., North Syracuse, both of N.Y., assignors to General Electric Company

Filed May 13, 1964, Ser. No. 367,610
Int. Cl. G01s 7/32
U.S. Cl. 343—17.2 PC **17 Claims**



1. A radar system for making precise determinations of target range and target length comprising:

means for providing RF pulses which are separated by equal increments of frequency and time,

means for transmitting said pulses,

means for receiving reflections of said pulses from targets within a range interval of interest,

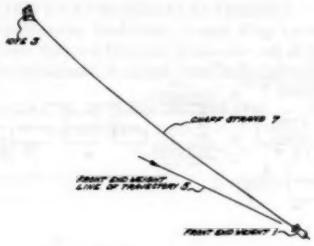
means for demodulating said reflections with local signals to provide IF signals, said local signals comprising pulses of the same rate and frequency sequence as said transmitted pulses but delayed with respect thereto, and

means for processing said IF signals to determine their relative phase shifts and to generate a precise measurement of range and length of targets within said range interval of interest.

3,715,754
TETHERED CHAFF STRAND COUNTERMEASURE WITH TRAILING END KITE

John F. W. Parry, Loma Linda, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 15, 1967, Ser. No. 670,013
Int. Cl. H01q 15/14; H04k 3/00
U.S. Cl. 343—18 B 6 Claims

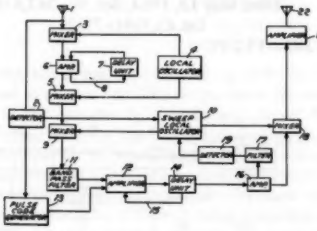


A tethered chaff strand countermeasure system having a trailing end kite to pull the chaff strand out of the line of trajectory of the front end object so as to form a reflecting helix.

3,715,755
REPETITIVE PULSE GENERATING SYSTEM

Theodore J. Goldan, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 10, 1957, Ser. No. 683,186
Int. Cl. H04k 3/00
U.S. Cl. 343—18 E 9 Claims



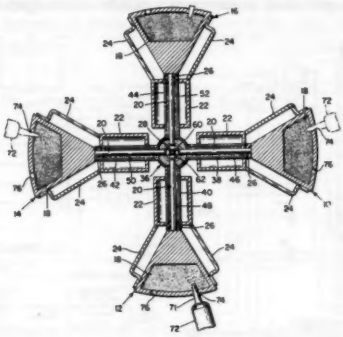
A received pulse produces a plurality of delayed similar pulses by stretching the received pulse and heterodyning it against a swept oscillator derived pulse to obtain a multifrequency pulse at lower frequency. This pulse recirculated through a delay unit and the plurality of successive pulses so produced are heterodyned against the multifrequency source to convert them to the original frequency.

3,715,756
MOISTUREPROOF MICROWAVE ANTENNA

William L. Mackie, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of Ser. No. 767,884, Aug. 27, 1968, abandoned. This application Jan. 21, 1970, Ser. No. 4,645
Int. Cl. B29d 27/04; C08g 22/44; H01g 1/40
U.S. Cl. 343—873 1 Claim

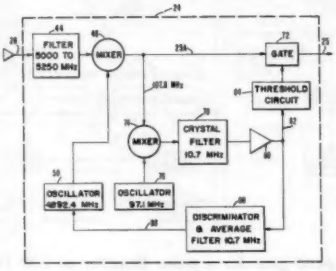
A moisture proof hollow electrical component such as a microwave antenna the interior of which is filled with a closed-cell, foam-in-place, low-density retarded polyurethane plastic substance having a specific dielectric constant approximately equal to that of the air which it replaces, thereby preserving the original electrical impedance characteristics and hence maintaining the operating efficiency of the antenna.



3,715,757
RADIO GUIDANCE SYSTEM WITH SEPARATE TRANSMISSION OF A STANDARD FREQUENCY SIGNAL TO ENHANCE THE DISCRIMINATION OF THE RECEIVER

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Pleasantville, N.Y.

Filed July 13, 1970, Ser. No. 54,510
Int. Cl. G01s 1/16
U.S. Cl. 343—108 R 21 Claims



A system for a craft to be guided including a receiver operable to receive guidance signals in a predetermined band of radio frequencies, the receiver also being capable of receiving a separate fixed standard frequency signal from a ground station for control of the receiver to enhance the discrimination function in discriminating the guidance signals.

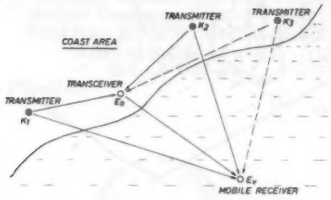
3,715,758
METHODS AND APPARATUS FOR PRECISE POSITIONING OF LOCATIONS

Friedhelm K. Sender, Hannover-Wulfel, Germany, assignor to Prakla Gesellschaft fur Praktische Lagerstattenforschung GmbH, Hannover, Germany

Filed July 7, 1970, Ser. No. 52,893
Claims priority, application Germany, July 10, 1969, P 19 34 960.1
Int. Cl. G01s 5/14
U.S. Cl. 343—112 R 20 Claims

A radio location system employing at least two fixedly installed transmitters operating on substantially continuous carrier frequencies and a fixedly installed reference transceiver

suitably located to receive the carrier frequencies from each of the transmitters. A station receiver is located at the location that is to be precisely positioned which synthesizes the frequencies of the two transmitters and determines position by developing traveltime information to the receiver, these synthesized carrier frequencies being absolutely determined



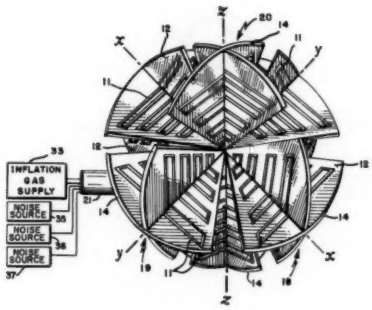
with respect to an atomic clock. A similar atomic clock in the reference transceiver similarly determines synthesized frequencies and their error with respect to the transmitted frequencies. These error corrections are converted to digital form and transmitted to the station receiver for correcting the developed traveltime information and hence developing precision positioning information.

3,715,759

UNFURLABLE ISOTROPIC ANTENNA

Frank J. Esposito, Nassau; Michael J. Pallas, Queens, and Robert W. Martin, Nassau, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force

Filed March 8, 1970, Ser. No. 24,412
Int. Cl. H01q *11/10*
U.S. Cl. 343—792.5 **2 Claims**



The invention is a broadband isotropic antenna of the triorthogonal type. It is a randomly polarized antenna system that has particular application in satellites. The antenna consists of three independent antenna elements arranged in a mutually orthogonal configuration. Each of the elements is mounted on unfurlable partitions contained within an inflatable spherical enclosure.

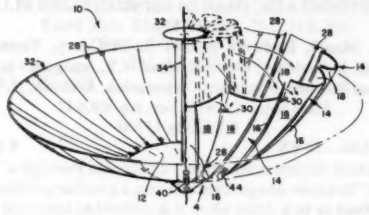
3,715,760

RIGID COLLAPSIBLE DISH STRUCTURE

William B. Palmer, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed April 7, 1971, Ser. No. 132,065
Int. Cl. H01q *15/20*
U.S. Cl. 343—915 **10 Claims**

A collapsible dish structure composed of a number of radial petal assemblies spaced circumferentially about a central circular support and having rigid arcuate center petals hinged at their inner ends to the support by means of hinge shafts coupled to the petals and rigid arcuate side panels hinged along their longitudinal edges to one another and the center petals in a manner such that the petal assemblies are foldable inwardly to a compact collapsed configuration wherein the dish structure may be stowed with a space-craft or the like and outwardly to a deployed configuration wherein the petals are disposed edge to edge to form a rigid dish conforming to a surface of revolution generated about the dish axis, such as a parabolic surface.

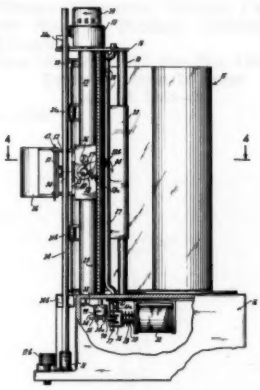


3,715,761

SEDIMENTATION RATE TEST INSTRUMENT

Isaac J. Drekter, Queens Village, N.Y.; Frank R. Bradley, Bronx, N.Y.; Morton P. Matthew, Norwalk, Conn., and Paul Delaney, Bronx, N.Y., assignors to Sedriter Corporation, New York, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,513
Int. Cl. G01n *33/16*
U.S. Cl. 346—33 A **25 Claims**



An instrument for automatically recording the falling sedimentation level during an hour-long blood sedimentation rate test. An assembly including a lamp and photo-detector tracks the falling sedimentation level and drops down vertically together with the serum-red cell interface. The falling assembly includes a pen. The assembly drops in equal increments and prior to each drop the pen is brought to bear against a strip of paper which moves at a constant rate past it. The resulting trace is a series of closely spaced dots, the verti-

cal axis of which represents the serum-red cell interface and the horizontal axis of which represents time. The hour-long test can be run unattended, and the unit shuts off automatically.

3,715,762

METHOD AND APPARATUS FOR GENERATING ELECTROSTATIC IMAGES USING IONIZED FLUID STREAM

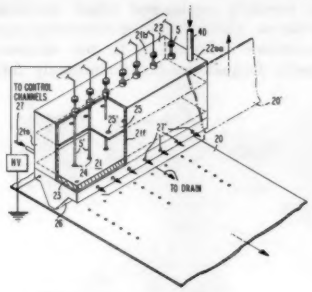
Peter J. Magill, Endwell; Robert E. McCurry, Vestal, and Charles A. Speicher, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,647

Int. Cl. G03g *15/00*

U.S. Cl. 346—74 ES **8 Claims**

An ionized stream is selectively channeled through a "printing head" to cause image formation on a precharged dielectric coated sheet or to a drain when it is desired to interrupt image formation. The ionized stream, in one embodiment, is channeled directly to the dielectric sheet to cause image formation and is interrupted by a control stream that diverts the ionized stream to the drain. An alternative embodiment provides for a

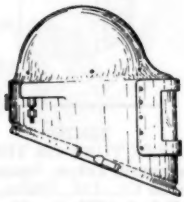


reversal in the functions of the control stream and the ionized stream so that image formation is obtained only when the ionized stream is diverted.

DESIGNS

FEBRUARY 6, 1973

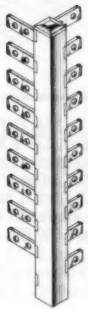
226,251
HEAD PROTECTIVE HOOD
Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.
Filed Nov. 27, 1970, Ser. No. 26,204
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



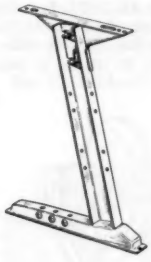
226,252
COMBINATION HANDLE AND HANGER FOR A BROOM OR BRUSH
David W. Anthony, Sudbury, and Richard C. Urie, Swampscott, Mass., assignors to Stanley Home Products, Inc., Westfield, Mass.
Filed Apr. 16, 1971, Ser. No. 134,924
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—4

226,253
HAIRBRUSH
David W. Anthony, Sudbury, and Richard C. Urie, Swampscott, Mass., assignors to Stanley Home Products, Inc., Westfield, Mass.
Filed Apr. 16, 1971, Ser. No. 134,923
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31

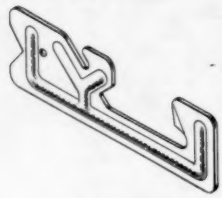
226,254
WALL-CORNER MOUNTED BOTTLE RACK
Karl Sigmund Smith, Orland Park, Ill. (ACSC 73–1588 Maxwell AFB, Montgomery, Ala. 36113)
Filed Feb. 23, 1971, Ser. No. 118,206
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—20



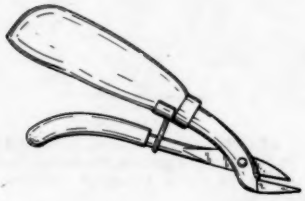
226,255
LEG UNIT FOR A WORKTABLE
John K. Williamson, Toronto, Ontario, Canada, assignor to National Machine Products Limited, Downsview, Ontario, Canada
Filed Mar. 15, 1971, Ser. No. 124,623
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



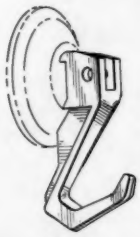
226,256
COMBINED BALE WIRE TYING AND CINCHING TOOL
Jay R. Guhl, San Leandro, Calif., assignor of a fractional part interest to W. Dean Park, San Leandro, Calif.
Filed May 20, 1971, Ser. No. 145,589
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—44



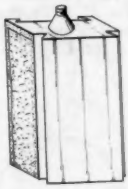
226,257
UPHOLSTERY STAPLE EXTRACTOR PLIERS
Clifton E. Robnett, Centerview, Mo.
(3109 Blackberry St., Mount Vernon, Ill. 62864)
Filed May 27, 1971, Ser. No. 147,729
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—52



226,258
HOOK
Jordan I. Rotheiser, Highland Park, Ill., assignor to Selfix, Inc.
Filed Mar. 15, 1971, Ser. No. 124,655
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—246



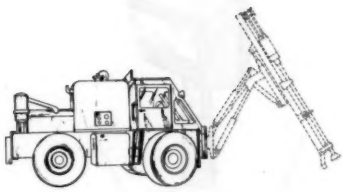
226,259
CONTAINER FOR LIQUIDS
Leard Evander Lisk, Jr., Summerfield, N.C., assignor to Lisk Enterprises Corporation, Greensboro, N.C.
Filed Oct. 8, 1971, Ser. No. 187,929
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—175



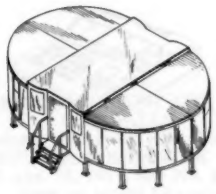
226,260
SQUEEZE TUBE OR THE LIKE
Kenji Hanamura, Tokyo, Japan, assignor to Tancho Co., Ltd., Osaka, Japan
Filed Feb. 9, 1971, Ser. No. 114,101
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—194

226,261
DOOR
William J. Horgan, Jr., 1299 Folkstone Drive, Pittsburgh, Pa. 15216
Original design application June 1, 1970, Ser. No. 23,254. Divided and this application June 17, 1971, Ser. No. 154,246
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

226,262
MOBILE DRILL UNIT
Arthur J. Trueblood, Salt Lake City, Utah, assignor to Western Road Machinery Company, Salt Lake City, Utah
Filed Jan. 4, 1971, Ser. No. 103,945
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3 A

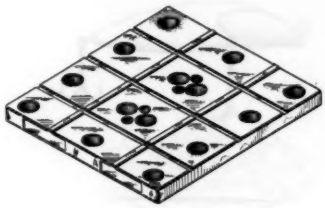


226,263
MOBILE HOME OR SIMILAR ARTICLE
William Bizzaro, Jr., 10 Huron Drive, Hudson, Mass. 01749
Filed Jan. 4, 1971, Ser. No. 103,962
Term of patent 14 years
Int. Cl. D12—*10*; D25—*03*
U.S. Cl. D14—3 E

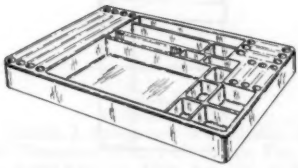


226,264
FORK LIFT VEHICLE
Donald A. Gilbrech, 1302 Beechwood Ave., Fayetteville, Ark. 72701
Filed June 24, 1971, Ser. No. 156,604
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D14—3

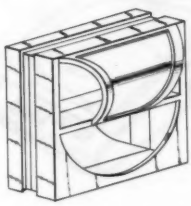
226,265
PALLET
Dennis M. Melnick and Mark Kubick, Baden, Pa., assignors to Pallet Development Inc., Ambridge, Pa.
Filed Oct. 22, 1971, Ser. No. 191,971
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3



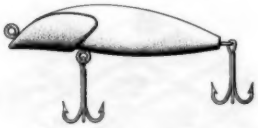
226,266
INSTRUMENT TRAY FOR USE IN HOSPITALS OR THE LIKE
Douglas J. Rem, 20525 Derby 48203, and David H. Smith, 18492 Alcoy 48205, both of Detroit, Mich.
Filed Oct. 21, 1970, Ser. No. 25,588
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D16—1 A



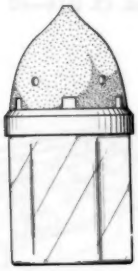
226,267
STRUCTURAL BUILDING BLOCK
Roland Spellier, Lemgo, Germany, assignor to Richard Heinze, Herford, Germany
Filed Nov. 9, 1971, Ser. No. 197,201
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



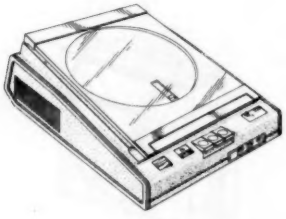
226,268
FISH LURE
Willie J. Teague, 30040 SW. 148th Ave., Homestead, Fla. 33123
Filed June 28, 1971, Ser. No. 157,810
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



226,269
DISPENSER FOR TOILET TANKS OR THE LIKE
George A. Sarandos, 6906 Ashcroft, Houston, Tex. 77006
Filed June 4, 1971, Ser. No. 150,264
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—3



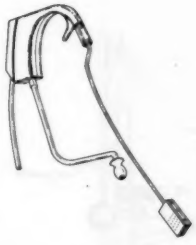
226,270
TEACHING MACHINE
Masayuki Sakuma, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed June 3, 1971, Ser. No. 149,873
Claims priority, application Japan Dec. 7, 1970
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D25—1



226,271
MULTIMETER CASING
Norman Holtzman, Los Angeles, Calif., assignor to Hanson-Hawk, Inc., a division of Orion Industries, Chatsworth, Calif.
Filed June 29, 1971, Ser. No. 158,147
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D26—1 Q

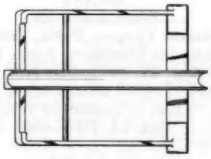
226,272
ELECTRONIC CALCULATOR
Hideki Ishii and Tatehiko Nakanishi, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Mar. 16, 1971, Ser. No. 125,024
Claims priority, application Japan Sept. 24, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

226,273
LIGHTWEIGHT HEADSET
John F. Tyson and James W. M. Bee, Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed Mar. 3, 1971, Ser. No. 120,801
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 H



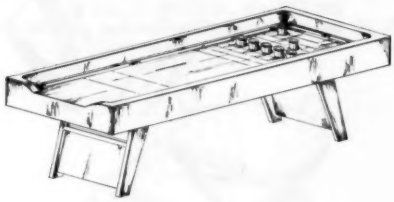
226,274
INDOOR ANTENNA OR SIMILAR ARTICLE
John David Callaghan, Cherry Hill, N.J., and Raymond Kaysen, Glenside, Pa., assignors to RCA Corporation
Filed Aug. 16, 1971, Ser. No. 172,376
Claims priority, application Great Britain May 20, 1971
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

226,275
POOL TABLE ATTACHMENT FOR PROJECTING CUE BALLS
Willard D. Sanford, East Point, Ga. (2604 Old Hapeville Road SW., Apt. 9, Atlanta, Ga. 30315)
Filed Apr. 12, 1971, Ser. No. 133,469
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3 R



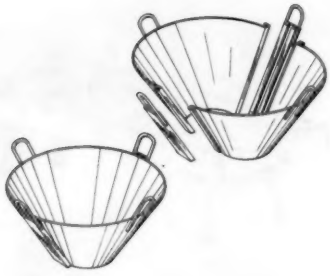
226,276
TOY CLOWN FIGURE
Alma A. Henney, 942 E. Navilla Place, Covina, Calif. 91722
Filed July 1, 1971, Ser. No. 159,103
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 A

226,277
GAME TABLE
Joseph J. Sparacino, West Berlin, N.J. (3001 Tennessee Ave., Fort Pierce, Fla. 33450)
Filed May 11, 1970, Ser. No. 22,931
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



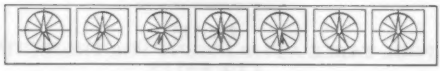
226,278
GOLF CLUB
Samuel Lombardo, 3419 Corinna Drive, Palos Verdes Peninsula, Calif. 90274
Filed July 23, 1971, Ser. No. 165,874
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

226,279
DISASSEMBLABLE TREE BALL TRANSPORTER
Eugene B. Eyerly, Denver, Colo., assignor to Lew Hammer, Inc.
Filed Mar. 24, 1971, Ser. No. 127,866
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D35—1



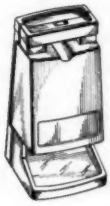
226,280
BROOCH OR SIMILAR ARTICLE
Alan H. Minter, 1602 W. Lynn, Austin, Tex. 78703
Filed Mar. 1, 1972, Ser. No. 231,069
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19 P

226,281
TIME INDICATOR FOR COOKING
Leroy C. Lowe, P.O. Box 1241, Seattle, Wash. 98111
Filed June 24, 1971, Ser. No. 156,582
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D52—6 B

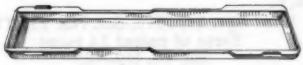


226,282
SPECTACLES
Luc André Marcel Tagnon, Paris, France, assignor to Societe des Lunetiers, Paris, France
Filed Apr. 19, 1971, Ser. No. 135,514
Claims priority, application France Nov. 6, 1970
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

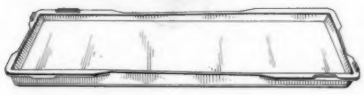
226,283
MICROSCOPE
John George Shield, St. Leonards-on-Sea, England, assignor to The Educational Supply Association Limited, Stevenage, Hertfordshire, England
Filed July 2, 1971, Ser. No. 159,580
Claims priority, application Great Britain Jan. 5, 1971
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



226,284
TRAY
Robert F. Bateman, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed June 9, 1971, Ser. No. 151,625
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10 E



226,285
INTERLOCKING TRAY
Robert F. Bateman, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed June 9, 1971, Ser. No. 151,626
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10 E

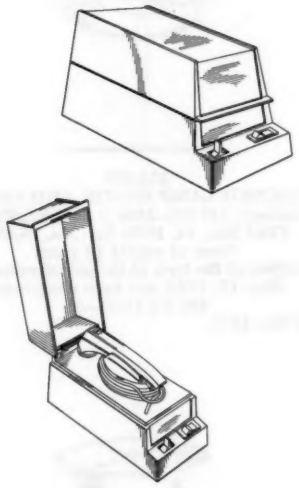


226,286
FINGER RING
Daniel Shiman, Maplewood, N.J., assignor to Shiman Industries Inc., Newark, N.J.
Filed Apr. 30, 1971, Ser. No. 139,300
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10

226,287
COMBINED LAMP SHADE AND MIRROR
Aime Trudeau, 227 NE. 26th St., Miami, Fla. 33137
Filed Dec. 14, 1970, Ser. No. 26,490
Term of patent 14 years
The portion of the term of the patent subsequent to May 10, 1985, has been disclaimed
Int. Cl. D26—*05*
U.S. Cl. D48—16 E

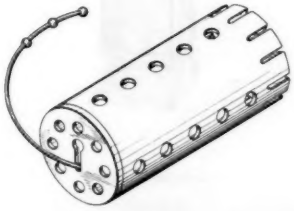
226,288
TELEPHONE INDEX
Francis Greif, London, England, assignor to British & International Proprietaries Limited, London, England
Filed Feb. 3, 1972, Ser. No. 223,403
Claims priority, application Great Britain Jan. 20, 1972
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 C

226,289
COMBINED STIMULATING AND CLEANING DEVICE
Medard W. Welch, 1111 Sheridan Road, Winnetka, Ill. 60093
Filed Jan. 20, 1971, Ser. No. 108,254
Term of patent 14 years
Int. Cl. D24—*05, 99*
U.S. Cl. D83—1

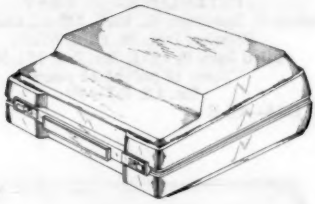


226,290
CATHETER
Charles H. Cohen and Vernon F. Leonard, Denver, Colo., assignors to Goldberg Plastics, Inc., Denver, Colo.
Filed Mar. 15, 1971, Ser. No. 124,648
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—12

226,291
COMBINED HAIR ROLLER AND ADJUSTABLE HAIR HOLDING BAND
George Gebhart, Seminole, Fla., assignor to Consolidated Foods Corporation, Chicago, Ill.
Filed Oct. 7, 1971, Ser. No. 187,592
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

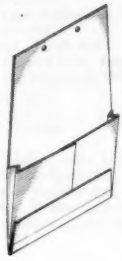


226,292
TYPEWRITER CARRYING CASE
James J. Bienkowski, East Syracuse, and Chester J. Abend, Camillus, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Apr. 13, 1971, Ser. No. 133,772
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1



226,293
ICE SHAVER
Isamu Kawamata, 18–14 Akatsuka 5-chome, Itabashi-ku, Tokyo, Japan
Filed July 14, 1971, Ser. No. 162,756
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1

226,294
POCKET INSERT FOR A FILING FOLDER
Rachel Gnader, 4140 Army St., San Francisco, Calif. 94120
Continuation-in-part of design application Ser. No. 15,712, Feb. 10, 1969. This application June 18, 1970, Ser. No. 23,557
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AAI Corporation: *See—*
Young, Robert B., 3,714,896.

Abbott Laboratories: *See—*
De Vault, Robert Larry, 3,715,352.
Hirata, Arthur Atsunobu, 3,715,427.

Abnett, Albert C.; and Foster, George B., to Reliance Electric Company. Inductive non-contact vibration analyzer which is independent of standoff distance. 3,715,659, Cl. 324-34.00d.

ACF Industries, Incorporated: *See—*
Carter, John H., 3,715,053.

Addressograph-Multigraph Corporation: *See—*
Van Dusen, Charles H., Jr.; and Brown, Paul, 3,714,891.

Adler, Robert, to Zenith Radio Corporation. Electro-optical groove tracking apparatus for video reproducing system. 3,715,524, Cl. 179-100.30v.

Advanced Digital Systems Inc.: *See—*
Polus, Anthony P.; and Scheel, Russell H., 3,715,040.

Agfa-Gevaert Aktiengesellschaft: *See—*
Bestenreiner, Friedrich, 3,715,154.
Engelsmann, Dieter; Hackenberg, Hubert; and Karl, Horst, 3,714,874.
Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, 3,715,261.
Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, 3,715,658.
Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, 3,714,882.
Schroder, Rolf, 3,714,877.

Ahl, Nils Goran; and Larsson, Lars Herbert, to Conrail AB. Weighing device. 3,714,997, Cl. 177-136.000.

Ainscough, John Brian: *See—*
Rigby, Frank; and Ainscough, John Brian, 3,715,273.

Ainslie, Robert E.: *See—*
Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., 3,715,668.

Ainsworth, Richard: *See—*
Stein, Wolfgang J.; Ainsworth, Richard; and Berkner, Horst D., 3,714.779.

Air Products and Chemicals, Inc.: *See—*
Longsworth, Ralph C., 3,714,796.

Air Reduction Company, Incorporated: *See—*
Hoffman, Joseph K., 3,715,413.

Aitken, James B., to Instant Structures, Inc. Portable building construction. 3,714,749, Cl. 52-70.000.

Aizawa, Masanobu; and Mori, Kijuu, to Stanley Electric Co., Ltd. Method for producing sheet supported coiled conductors. 3,714,691, Cl. 29-25.150.

Aizawa, Tatsuo: *See—*
Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213.

Ajax Magnethermic Corporation: *See—*
Biringer, Paul Peter, 3,715,647.

Ajinomoto Co., Inc.: *See—*
Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, 3,715,279.

Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, to Hitachi, Ltd. Method of and apparatus for attaining focusing following variation in magnification in electron microscope. 3,715,582, Cl. 250-49.50a.

Akai, Naotoshi: *See—*
Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, 3,715,431.

Aktiebolaget Atomenergi: *See—*
Hammarlind, Alf Martin, 3,715,561.

Alburger, James R. Inspection penetrant development process employing fusible waxes. 3,715,227, Cl. 117-37.00r.

Allen, George W.; and Gray, Charles S. Retractable suspension and running gear for trailers. 3,715,128, Cl. 280-43.220.

Allen, John Kenneth, to RCA Corporation. Service switch arrangement for improved interlace performance. 3,715,493, Cl. 178-7.30r.

Allen, Kenneth C.; and Boshinski, Edwin E., to Hobart Manufacturing Company, The. Weighing scale with improved dash pot. 3,714,998, Cl. 177-189.000.

Allen, Michael George; and Tiers, George Van Dyke, to Minnesota Mining and Manufacturing Company. Preparation of poly(isocyanurate-urethanes) using trithiocarbonates as catalysts. 3,715,337, Cl. 260-77.5nc.

Allen, Robert D.; and Lysher, Wayne M., to McDonnell Douglas Corporation. Composite thermal insulation. 3,715,265, Cl. 161-125.000.

Allen, Walter K.: *See—*
Laughlin, Charles R.; Hollenbaugh, Roger C.; and Allen, Walter K., 3,715,663.

Allied Chemical Corporation: *See—*
Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., 3,715,425.
Rumanowski, Edmund J., 3,715,380.
Spaunburgh, Richard G.; and Hino, John B., 3,715,381.
Truesdell, Robert E.; and Nienstedt, William H., 3,715,256.

Allis-Chalmers Corporation: *See—*
Dreisin, Alexander, 3,714,935.
Dreisin, Alexander, 3,714,936.

Allison, Birt, Jr.: *See—*
Brown, Rene Paul; Allison, Birt, Jr.; and D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky, 3,715,408.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Grune, Per-Olof; Pucher, Walter; and Sandkvist, Hugo, 3,715,542.

Allport, Walter, to Cutler-Hammer, Inc. Film duplicating apparatus. 3,715,159, Cl. 355-110.000.

Alonso, Gabriel: *See—*
Fontaine, Bernard J.; and Alonso, Gabriel, 3,715,728.

Altman, Leonard F.; and Sharp, Marcus, to General Instrument Corporation, mesne. Aluminum etching solution. 3,715,250, Cl. 156-22.000.

Alves Photo Service, Inc.: *See—*
Lee, Richard G., 3,714,858.

Amari, Katsutoshi: *See—*
Tsuchiya, Noriyuki; Amari, Katsutoshi; Moriya, Takao; and Takahashi, Shideko, 3,715,285.

Amato, Jack C.; and Sansone, Eugene A., to Singer Company, The. Shuttle boxing detector for fly-shuttle looms. 3,714,972, Cl. 139-336.000.

AMBAC Industries, Incorporated: *See—*
Licht, John J., 3,715,521.

Americal Corporation: *See—*
Minton, Clarence W., 3,714,799.

American Air Filter Company, Inc.: *See—*
Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.

American Can Company: *See—*
Batchelar, Raymond Luscombe; and Heinle, Carl William, 3,715,050.
Gedde, Erik, 3,715,054.
Hanke, Edward Herman, 3,715,051.
Kinkel, Christian Frederick; and Phalin, Thomas Lawrence, 3,715,052.
Kubacki, Edward Frank, 3,714,854.
Phalin, Thomas Lawrence; and Birkholz, William Stephen, 3,714,755.
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American Cyanamid Company: *See—*
Epstein, Joseph William; and Goldman, Leon, 3,715,361.
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American Monitor Corporation: *See—*
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American Optical Corporation: *See—*
Day, Christopher C.; and Grace, Wesley R., 3,714,939.
Young, Charles Gilbert, 3,715,682.

American Standard, Inc.: *See—*
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American Velcro Inc.: *See—*
Erb, George H., 3,715,415.

Amon, Joy Mary: *See—*
Amon, Robert, 3,715,429.

Amon, Robert; deceased (Amon, Joy Mary; Administratrix; and Tobin, Julian Jacob; Joint Administrator). Deformation of hair with thiourea dioxide and activating agents therefor. 3,715,429, Cl. 424-71.000.

AMP Incorporated: *See—*
Hoffman, Joseph Willard, 3,714,712.
Hoffman, Norman Edwin, 3,715,459.
Swengel, Robert Charles, Sr., 3,715,629.

AMP Incorporated, mesne: *See—*
Teagno, Wladimiro; and Campari, Luigi, 3,715,457.
Trevisiol, Franco; and Bergonzi, Mario, 3,715,527.

Ampeg Company, Inc., The: *See—*
Figlin, Murray S.; and Boenisch, John R., 3,715,676.

Anchor Hocking Corporation: *See—*
Roberts, Cecil P.; and Ochs, Charles S., 3,714,760.

Anderson, Melvin R., to Westinghouse Electric Corporation. Terminal block with snap-in components. 3,715,707, Cl. 339-198.00r.

Anderson, Philip J.; and Ng, Daniel Y. C., to Institute of Gas Technology. System for increasing the shock loading resistance of structures. 3,714,909, Cl. 109-1.00s.

Anderson, Ralph; and Beyer, Rodney B., to Future Systems, Inc. Electroplating apparatus including means to disturb the boundary layer adjacent a moving electrode. 3,715,299, Cl. 204-212.000.

Andrews, David Arthur, to Toms River Chemical Corporation. Preparation of 1,4-diamino-2-alkoxy (phenoxy)-anthraquinones. 3,715,373, Cl. 260-380.000.

Angeles Metal Trim Co.: *See—*
Costruba, Peter, 3,714,748.

Angelica Corporation: *See—*
Hardy, John C., 3,714,947.
Mirabella, Anthony C., 3,714,668.

Angelstrand, Borje; and Mostrom, Ragnar, to Saab Aktiebolag. Film moving means in machine for reading bubble chamber photographs. 3,715,086, Cl. 242-67.300.

Anninos, Athanasious P., to Emery Industries, Inc. Drycleaning method and detergents therefor. 3,715,186, Cl. 8-142.000.

Aoki, Masayoshi. Waterproof watch with interlocking crystal support ring and movement support ring. 3,714,775, Cl. 58-90.00r.

Applebaum, Sidney P.; and Geyer, Bernard H., Jr., to General Electric Company. Coherent range and length resolution. 3,715,753, Cl. 343-17.2pc.

Aqua-Chem, Inc.: *See—*
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Araki, Shinichi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,715,063.

Arbogast & Bastian, Inc.: *See—*
Feely, Robert L., 3,715,218.

Archer, Donald H., to Raytheon Company. Multi-beam radio frequency system. 3,715,749, Cl. 343-5.00r.

Archibald, Frederick R.; and Hatch, Gerald G., to Falconbridge Nickel Mines Limited. Electric arc furnace operation. 3,715,200, Cl. 75-10.000.

Arciprete, Genio R., to Dennison Manufacturing Company, mesne. Data input encoder. 3,715,745, Cl. 340-347.0dd.

Arcos Corporation: *See—*
Norcross, James E.; and Garwood, George, 3,715,559.

Armco Steel Corporation: *See—*
Clements, William C.; and Bootz, William, 3,714,787.
Evans, Ralph E.; and Blower, Howard E., 3,714,786.

Aro Corporation, The: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Ashland Oil, Inc.: *See—*
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Astengo, Ralph A., to Sundstrand Data Control, Inc. Ground proximity warning system utilizing radio and barometric altimeter combination. 3,715,718, Cl. 340-27.00r.

Atlantic Richfield Company: *See—*
Howell, Eddie P.; Hardison, Jack E.; and Campbell, William M., 3,714,832.
Meyers, Joseph A., III; and Cahill, Joseph A., 3,715,185.
Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., 3,715,312.
Wolgemuth, Larry G.; and Fritock, William H., 3,715,385.

Atwood, George R.: *See—*
Dowling, Donald J.; and Atwood, George R., 3,715,655.

Audesse, Emery G.; Tartakoff, Alexander; and Robertson, John K., to GTE Sylvania Incorporated. Shatter-resistant incandescent lamp. 3,715,232, Cl. 117-72.000.

Auer, Siegfried O., to United States of America, National Aeronautics and Space Administration. Micrometeroroid analyzer. 3,715,590, Cl. 250-83.30r.

August Herzog Maschinenfabrik: *See—*
Berger, Heinz, 3,714,862.
Strangfeld, Reiner, 3,714,861.

Aupoix, Marcel; and Moisson-Franckhauser, Francois, to Compagnie Generale d'Electricite. Cryogenic connection enclosure. 3,715,453, Cl. 174-15.00c.

Automata Corporation: *See—*
Azure, Leo L., Jr., 3,715,568.

Avco Corporation: *See—*
Setterblade, Earl O., 3,714,920.
Stein, Wolfgang J.; Ainsworth, Richard; and Berkner, Horst D., 3,714,779.

Azure, Leo L., Jr., to Automata Corporation. System for gathering and transmitting source data. 3,715,568, Cl. 235-61.70r.

Bacskai, Robert, to Chevron Research Company. Linear polyester backbone quaternary ammonium polyelectrolytes. 3,715,335, Cl. 260-75.00n.

Badische Anilin- & Soda Fabrik Aktiengesellschaft: *See—*
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.

Badische Anilin- Soda-Fabrik Aktiengesellschaft: *See—*
Gaeng, Manfred; and Dimroth, Peter, 3,715,360.

Bahnson Company, The: *See—*
Sloan, Donald A., 3,714,676.

Bahr, Alfred J., to Stanford Research Institute. Electrically controlled reflection of acoustic surface waves. 3,715,674, Cl. 330-12.000.

Bakelite Xylonite Limited: *See—*
Butcher, Edward Peter, 3,715,310.

Baker Perkins Limited: *See—*
Edwards, Albert, 3,715,106.

Bales, Emmett R.: *See—*
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Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, to General Foods Corporation. Successive quenching of coffee during roasting. 3,715,215, Cl. 99-68.000.

Balzer, Norbert R.; and Kasper, Robert J., to Park-Ohio Industries, Inc. Slab heating method and apparatus. 3,715,556, Cl. 219-10.690.

Bancroft, H. S., Corporation: *See—*
Cunnane, Jeffrey B., 3,715,258.

Bandurco, Victor; Elpern, Bill; and Shroff, James R., to USV Pharmaceutical Corporation. N-amino-benzamidines. 3,715,396, Cl. 260-564.00r.

Banks, Gary R. Device for displaying sheet members having indicia thereon. 3,714,725, Cl. 40-84.000.

Barber, Anthony Clifford: *See—*
Clayton, Anthony Robert King; and Barber, Anthony Clifford, 3,715,243.

Barber, Franklin D., to Standard Car Truck Company. Dampened railway car truck. 3,714,905, Cl. 105-195.0db.

Barlow, Richard A. Expandable A-frame type trailable building structure. 3,714,746, Cl. 52-69.000.

Barnes, Onald R., to Mohr, John, & Sons. Poultry shackle. 3,715,026, Cl. 198-177.000.

Barnett, Allen M.; and Galginattis, Simeon V., to General Electric Company. Selective liquid phase epitaxial growth process. 3,715,245, Cl. 148-171.000.

Barone, Bruno J.: *See—*
Croce, Louis J.; and Barone, Bruno J., 3,715,390.

Barone, Bruno J.; and Croce, Louis J., to Petro-Tex Chemical Corporation. Promotion of the oxidation of mononuclear aromatic compounds. 3,715,391, Cl. 260-523.00a.

Barthel, Rolf: *See—*
Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, 3,715,597.

Bartholomew, Roger F.; and Garfinkel, Harmon M., to Corning Glass Works. Method of removing SO_2 and NO_2 from gases. 3,715,187, Cl. 423-235.000.

BASF Wyandotte Corporation: *See—*
Louvar, Joseph F.; and Nichols, Newlin S., 3,715,402.

Bastide, Claude, to Etablissements Roffo. Spraying device for a liquid distributing system for agricultural use. 3,715,080, Cl. 239-444.000.

Batchelar, Raymond Luscombe; and Heinle, Carl William, to American Can Company. Full panel easy open end. 3,715,050, Cl. 220-54.000.

Battey, Robert F., to FMC Corporation. Apparatus and method for handling volatile liquids. 3,714,790, Cl. 62-54.000.

Batts, Colossie N. Variable time base integrator circuit for buffet signal measurements. 3,714,827, Cl. 73-147.000.

Bauer, Wolfgang: *See—*
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.

Bauernfeind, Jacob Christopher; and Mitrovic, Milan, to Hoffmann-La Roche Inc. Growth promotion in swine. 3,715,433, Cl. 424-229.000.

Baum, Donald J. Golf game device. 3,715,123, Cl. 273-35.00r.

Baum Electrophysik GmbH: *See—*
Baum, Walter; and Still, Michael, 3,715,673.

Baum, Walter; and Still, Michael, to Baum Electrophysik GmbH. Noise suppresion for communication cables. 3,715,673, Cl. 328-165.000.

Baumann, Hans D. Adjustable fluid restrictor method and apparatus. 3,715,098, Cl. 251-121.000.

Bausch & Lomb Incorporated: *See—*
Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., 3,715,166.

Bayer Aktiengesellschaft: *See—*
Bockmann, Walter, 3,715,283.
Traubel, Harro; and Oertel, Harald, 3,715,326.

Bayes, Lowell D.; and Cole, Robert B., to Belden Corporation. Electrical cable structure. 3,715,458, Cl. 174-113.00r.

Bayless, Jack H., to Esso Production Research Company. Steam oil recovery process. 3,714,985, Cl. 166-303.000.

Beagles, Robert, to TRW Inc. Intrustion detection system employing triple coincidence space-time logic. 3,715,712, Cl. 340-276.000.

Beals, Clifford L. Medicine dispensing cabinet. 3,715,148, Cl. 312-209.000.

Beard, William L., Jr.; and Hahn, Ronald E., to Whirpool Corporation. Knit cycle for clothes dryers. 3,714,717, Cl. 34-45.000.

Becker, Karl, KG Maschinenfabrik: *See—*
Becker, Reinhard, 3,715,057.

Becker, Reinhard, to Becker, Karl, KG Maschinenfabrik. Apparatus for separating and/or counting individual elements of a plurality. 3,715,057, Cl. 221-211.000.

Beckman Instruments, Inc.: *See—*
Cosgrove, Richard E.; Krull, Irwin H.; and Mask, Charles A., 3,715,297.
Gilbert, Paul T., 3,714,829.

Beeson, Phillip, to United States of America, Air Force. Method for forming thrust chambers. 3,714,695, Cl. 29-157.00c.

Belardinelli, Giorgio: *See—*
Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, 3,715,378.
Belden Corporation: *See—*
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Bell & Howell Company: *See—*
Freeland, Stanley R., 3,715,149.
Koeber, Henry J., 3,715,161.
Bell, Allan D., Jr., to Dektor Counterintelligence and Security. Telephone security device. 3,715,514, Cl. 179-81.00e.
Bell Telephone Laboratories, Inc.: *See—*
Lynes, Dennis Joseph, 3,715,732.
Bell Telephone Laboratories, Incorporated: *See—*
Brown, Earl Franklin; and Kaminski, William, 3,715,489.
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Feiner, Alexander; and Harding, Philip A., 3,715,733.
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Gordon, Eugene Irving; and Maydan, Dan, 3,715,685.
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Hirsch, Donald; and Spaulding, David Adams, 3,715,670.
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Panousis, Peter Theodore; and Waggener, Herbert Atkin, 3,715,249.
Sessler, Gerhard Martin; and West, James Edward, 3,715,500.
Bender, Frederick; Clermont, Louis-Philippe; and Powden, Alan Warren. Delignification of lignocellulosic materials with a solution of nitrogen dioxide in aliphatic hydrocarbon solvent. 3,715,268, Cl. 162-72.000.
Bendix Corporation, The: *See—*
Bobrowicz, Vincent F.; and Henegar, Hubert B., 3,715,644.
Braunlich, Peter F., 3,715,583.
Carreras, Luis Enrique, 3,715,103.
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Michel, Donald E.; and Komatinsky, Richard R., 3,715,635.
Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James W., 3,715,706.
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Beneking, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Radio-frequency line. 3,715,631, Cl. 317-234.00r.
Bennett, Dale E. Vehicle location and heading computer system. 3,715,572, Cl. 235-150.200.
Bennett, Donald Perry, Jr., 1/2 to Gerry, Martin, E. Propulsion method in an inverse hybrid rocket motor. 3,714,783, Cl. 60-207.000.
Benson, Gustav Eric Valdemar, to Perpedos AB. Dispensing apparatus. 3,715,060, Cl. 222-207.000.
Benson, Richard J. Fishing device. 3,714,731, Cl. 43-43.110.
Bentley, Albert Byron: *See—*
Bentley, Clarence H., 3,714,965.
Bentley, Clarence H., 20% to Bentley, Delbert John, 20% to Bentley, Albert Byron, 20% to Bentley, Rodney Douglas and 20% to Bentley, David Alan. Pressure relief valve. 3,714,965, Cl. 137-541.000.
Bentley, David Alan: *See—*
Bentley, Clarence H., 3,714,965.
Bentley, Delbert John: *See—*
Bentley, Clarence H., 3,714,965.
Bentley, James Sydney, to Photographic Silver Recovery Limited. Method of recovering silver from waste silver solutions. 3,715,291, Cl. 204-109.000.
Bentley, Rodney Douglas: *See—*
Bentley, Clarence H., 3,714,965.
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Berger, Heinz, to August Herzog Maschinenfabrik. Braiding machine for brading knotless netting. 3,714,862, Cl. 87-8.000.
Bergonzi, Mario: *See—*
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Berkey, Earl R.; and Keener, Everett L., to United States Steel Corporation. Drift corrector for transducers. 3,714,806, Cl. 72-19.000.
Berkner, Horst D.: *See—*
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Bernstein, Julius; Schildkraut, Sid I.; and Muller, John P. Unipolar acoustic pulse generator. 3,715,710, Cl. 340-5.00r.
Berry, Walter L., Jr.; Nisonger, Dan P.; and Craig, Preston S., to Thiokol Chemical Corporation. Process for the manufacture of orthochlorobenzalmalononitrile. 3,715,379, Cl. 260-465.00g.
Bestenreiner, Friedrich, to Agfa-Gevaert Aktiengesellschaft. Three-dimensional picture projection. 3,715,154, Cl. 352-61.000.
Bethlehem Corporation, The: *See—*
Price, James F.; and Shook, Kenneth, 3,714,944.
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Anderson, Ralph; and Beyer, Rodney B., 3,715,299.
Bhikuni, Roop S.; and Cormany, Joseph L., Jr., to Goodyear Tire & Rubber Company, The. Polyamide in combination with polycarbonate, metal complex, polyisocyanating agent for polyester modification and rubber tire structures made therefrom. 3,714,772, Cl. 5-153.000.
Biet, Jean-Pierre, to Compagnie General d'Electricite. Window for a laser tube end piece. 3,715,684, Cl. 331-94.500.
Billeter, Henry R., to Sloan Valve Company. Angle cocks with vent valves. 3,714,968, Cl. 137-596.200.
Billings, Ruth E.: *See—*
Sullivan, Hugh R.; and Billings, Ruth E., 3,715,359.
Biringer, Paul Peter, to Ajax Magnethermic Corporation. Frequency converter for converting multi-phase low frequency alternating current into single-phase higher frequency alternating current. 3,715,647, Cl. 321-7.000.
Birkholz, William Stephen: *See—*
Phalin, Thomas Lawrence; and Birkholz, William Stephen, 3,714,755.
Birnbaum, Burton H.; and Spier, Daniel J., to Computer Instruments Corporation. Method and apparatus for handling data from a plurality of channels. 3,715,510, Cl. 179-15.0bm.
Bishop, Walton B., to United States of America, Navy. Omnidirectional reflected interrogation rejector. 3,715,750, Cl. 343-6.8lc.
Bitko, Sheldon S., to Fifth Dimension Inc. Position insensitive mercury switch having a magnetically actuated slug floating in mercury. 3,715,546, Cl. 200-166.00c.
Blake, James E., to General Electric Company. Parabola generator moving error corrector. 3,715,487, Cl. 178-7.300.
Blanch, Charles H.; and Kovacik, James W. Miniaturized electric cord reel. 3,715,526, Cl. 191-12.20r.
Blanchard, Jack W.: *See—*
Tilton, Homer B.; and Blanchard, Jack W., 3,715,617.
Blasbalg, Herman L., to International Business Machines Corporation. Switching circuits employing orthogonal and quasi-othogonal pseudo-random code sequences. 3,715,508, Cl. 179-15.0bc.
Blatt, Leland F. Dual grip actuating unit with travel cylinder assembly. 3,714,870, Cl. 92-140.000.
Blau, Werner; and Gerdes, Theo. Two-part screw closure cover. 3,715,075, Cl. 220-39.00r.
Blewitt, Donald D., to Westinghouse Electric Corporation. Current limiting fuse. 3,715,698, Cl. 337-166.000.
Blinow, Igor: *See—*
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Bloch, Gilbert: *See—*
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Bloch, Martin, to Frequency Electronics, Inc. Contact heaters for quartz crystals in evacuated enclosures. 3,715,563, Cl. 219-210.000.
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Webb, Robert H., 3,714,819.
Blower, Howard E.: *See—*
Evans, Ralph E.; and Blower, Howard E., 3,714,786.
Bobrowicz, Vincent F.; and Henegar, Hubert B., to Bendix Corporation, The. Proportional interpolator in multiaxis machines. 3,715,644, Cl. 318-573.000.
Bobst, J., & Fils, S.A.: *See—*
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Bockmann, Walter, to Bayer Aktiengesellschaft. Process for distilling benzyl chloride or mixtures containing benzyl chloride. 3,715,283, Cl. 203-6.000.
Boenisch, John R.: *See—*
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Bohman, Carl E., to Sperry Rand Corporation. Underwater localization system. 3,715,577, Cl. 340-6.00r.
Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, to Rhone-Poulenc S.A. Process for the preparation of lactic acid. 3,715,394, Cl. 260-535.00r.
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Bolt Associates, Inc.: *See—*
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Borg-Warner Corporation: *See—*
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Bosch, Robert, Elektronik GmbH: *See—*
Prause, Dieter; and Sost, Rolf, 3,715,475.
Boshinski, Edwin E.: *See—*
Allen, Kenneth C.; and Boshinski, Edwin E., 3,714,998.
Boterweg, Jelle. Watering apparatus for poultry. 3,714,929, Cl. 119-80.000.
Bowlby, James F. G. Single use film developer and repturable seal therefor. 3,714,881, Cl. 95-89.00r.
Boyd, Clive Reginald, to Spurway's Industries Pty. Limited. Blind rivet pulling tool. 3,714,810, Cl. 72-391.000.
Boyle, Ralph C.; and Paulius, Leonard, to International Harvester Company. Reversible power take-off shaft. 3,715,704, Cl. 74-15.400.
BP Chemicals Limited: *See—*
Yeomans, Bertram, 3,715,392.

Bracey, Robert A. Adjustable latching mechanism. 3,714,843, Cl. 74-527.000.

Bracht, Ernest F.: *See—*
Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., 3,715,668.

Braddon, Frederick D., to Sperry Rand Corporation. Ship's turn rate control system. 3,715,571, Cl. 235-150.200.

Bradley, Frank R.: *See—*
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Brannen, William T., to Standard Oil Company. Hydrocarbon fuel and lubricating oil solutions of trialkyl phosphite-long chain alkenylsuccinic anhydride reaction. 3,715,311, Cl. 252-49.800.

Braselmann, Ferd., Firma: *See—*
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Braselmann, Ferdinand, to Braselmann, Ferd., Firma. Lifting jack. 3,715,102, Cl. 254-96.000.

Braun, Paul E. Recoil stock. 3,714,726, Cl. 42-74.000.

Braunlich, Peter F., to Bendix Corporation, The. Surface imaging utilizing exoelectron emission. 3,715,583, Cl. 250-71.00r.

Bray, Andrew M., to Magna-Graphics Corporation. Coating mat. 3,714,692, Cl. 29-129.000.

Bredt, James H.; and Kendall, Louis F., Jr., to General Electric Company. Doped tin telluride brazing material for semiconductive thermoelectric generator elements. 3,715,241, Cl. 136-237.000.

Bresson, Richard J., to Eastman Kodak Company. Camera apparatus adapted for operation with auxiliary light source. 3,714,871, Cl. 95-10.00c.

Breuer, David R., to TRW Inc. Integratable high speed reversible shift register. 3,715,030, Cl. 207-221.00r.

Brey, Hans: *See—*
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Bril, Alfred: *See—*
De Mesquita, Albert Hijman Gomes; and Bril, Alfred, 3,715,611.

Brinkman, William Guy, to General Electric Company. Dynamoelectric machine cooled by a rotating heat pipe. 3,715,610, Cl. 310-54.000.

Bristol, Edgar H., II., to Foxboro Company, The. Method and apparatus for compensatory control of interacting process variables. 3,714,952, Cl. 137-1.000.

British Ropes Limited: *See—*
Paddington, Arthur Loftus, 3,715,135.

Broadley, Donald. Method of and means for combating sodium fires. 3,714,986, Cl. 169-1.00a.

Bromm, Charles A.: *See—*
Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.

Brooker, Leslie G S.; and Fumia, Arthur, Jr., to Eastman Kodak Company. Cyanine dyes containing a cyclopentanone nucleus. 3,715,351, Cl. 260-240.400.

Brossard, Bernard Pierre: *See—*
Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, 3,715,394.

Broughton, Donald B., to Universal Oil Products Company. Hydrocarbon separation. 3,715,409, Cl. 260-674.0sa.

Browell, George L.; and Wilson, Leon W., Jr., to United States Steel Corporation. Photochemical process. 3,715,294, Cl. 204-163.00r.

Brown, Earl Franklin; and Kaminski, William, to Bell Telephone Laboratories, Incorporated. Apparatus for preventing buffer overflow in video encoding systems by increasing the scanning rate of a camera during the time interval of the encoding. 3,715,489, C. 178-7 .100.

Brown, Laddie L., to American Metal Climax, Inc. Retort bumping machine. 3,714,673, Cl. 15-104.10r.

Brown, Maurice H. Wire terminal making and assembling. 3,714,708, Cl. 29-624.000.

Brown, Paul: *See—*
Van Dusen, Charles H., Jr.; and Brown, Paul, 3,714,891.

Brown, Rene Paul; Allison, Birt, Jr., and D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky, to Cosden Oil & Chemical Company. Separation of diethylbenzene isomers by distillation and dehydrogenation. 3,715,408, Cl. 260-669.00a.

Brown, Richard M.: *See—*
Gunter, William D., Jr.; and Brown, Richard M., 3,715,152.

Brown, Theodore G. Game table. 3,715,122, Cl. 273-136.00z.

Brown, Wade E.: *See—*
Sears, Bobby Joe; and Brown, Wade E., 3,714,948.

Bruen, Charles P.: *See—*
Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., 3,715,425.

Bruggemann, Hans; and Kulzer, Rudolf, to Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft. Arrangement for automatically testing the grip of gripping jaw means of cablecars on a tension cable. 3,714,904, Cl. 104-202.000.

Brunswick Corporation: *See—*
Draxler, James R., 3,715,650.

Brush, R. John H.; and Singleback, George W., to General Electric Company. Tint control circuit using phase splitter. 3,715,479, Cl. 178-5.4he.

Bucher, Robert W., to Goodyear Tire & Rubber company, The. Method of inserting flexible strand members through a perforate fitting. 3,714,699, Cl. 29-241.000.

Bullard, Edward P., III. Drafting machine. 3,714,714, Cl. 33-80.000.

Bullard, Martin B. Chain saw cutting tooth and method for making it. 3,714,974, Cl. 83-831.000.

Burkhalter, Robert; and Congdon, George L., to Norland Corporation. Limb holder positioner for bone mineral analyzer. 3,715,587, Cl. 250-50.000.

Burns, Simon Pierce; and Hartman, Henry Edmund, to Jefferson Chemical Company, Inc. Recovery of propylene oxide from contaminants by distillation in the presence of acetone or acetone-methanol mixtures. 3,715,284, Cl. 203-56.000.

Burroughs Corporation: *See—*
Caspari, Georg K., 3,715,021.

Burton, Arthur, to Imperial Chemical Industries, Limited. Decorative wall covering. 3,715,264, Cl. 161-82.000.

Burton, Charles A.: *See—*
Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., 3,715,174.

Busch, Edward R.; and Wood, Guy B., to Weston Instruments, Inc. Thickness change radiation gauge. 3,715,592, Cl. 250-83.30d.

Busch, Josef: *See—*
Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, 3,714,882.

Bush, Clarence C., to United States of America, Army. Apparatus for measuring skin friction. 3,714,824, Cl. 73-117.400.

Bushick, Ronald D., to Sun Oil Company. Process for producing sym-octahydroanthracene from sym-octahydrophenanthren. 3,715,406, Cl. 260-668.00f.

Butcher, Edward Peter, to Bakelite Xylonite Limited. Fire-retardant compositions. 3,715,310, Cl. 252-8.100.

Byram, Robert J.; Culver, Mark N.; and Van Ostrom, David L., to General Motors Corporation. Automatic cranking system for providing power assist upon vehicle engine stall. 3,715,005, Cl. 180-103.000.

Cahill, Joseph A.: *See—*
Meyers, Joseph A., III; and Cahill, Joseph A., 3,715,185.

Caldwell, Robert H. Tire chain and connector. 3,714,976, Cl. 152-228.000.

Calfee, Richard W.; and Hopner, Emil, to International Business Machines Corporation. Color video recording and playback system. 3,715,474, Cl. 178-5.400.

Calrk, Frederick G., to Eastman Machine Company. Knife sharpening mechanism. 3,714,742, Cl. 51-246.000.

Calvert, Orville M.: *See—*
Holcombe, Edward L.; Calvert, Orville M.; and Kessel, William M., 3,714,754.

Camdex Inc.: *See—*
Leich, Robert A., 3,714,860.

Cameron, Richard William, mesne: *See—*
French, Walter K., 3,714,804.

Campari, Luigi: *See—*
Teagno, Wladimiro; and Campari, Luigi, 3,715,457.

Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., to Minnesota Mining and Manufacturing Company. Free exciton indirect transition laser. 3,715,162, Cl. 356-30.000.

Campbell, Kenneth C.; and Rhinehart, Robert R., Jr., to Celanese Corporation. Filter start-up in dry spinning acrylonitrile copolymer. 3,715,416, Cl. 264-39.000.

Campbell, Larry E., to Corning Glass Works. Soluble and colloidal silicates. 3,715,224, Cl. 106-74.000.

Campbell, Robert Riddle; Honnold, George Herbert; and Lefkowitz, Michael, to Bell Telephone Laboratories, Incorporated. Interrupt network to protect a voice frequency signal detector from being talked-off by outgoing speech signals. 3,715,518, Cl. 179-84.0f.

Campbell, William M.: *See—*
Howell, Eddie P.; Hardison, Jack E.; and Campbell, William M., 3,714,832.

Canadian Fishing Company Limited, The: *See—*
Van Snellenberg, Anton P. M., 3,714,681.

Canon Kabushiki Kaisha: *See—*
Hasegawa, Goro; and Iura, Yukio, 3,714,878.
Mashimo, Yukio; Mizui, Seiichiro; and Takishima, Yoshiyuki, 3,714,872.

Canron, Inc.: *See—*
Stewart, John Kenneth, 3,714,901.

Cappel, Marie-Luise: *See—*
Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,714,683.

Carbonnel, Henri, to Groupement Atomique Alsacienne Atlantique. Means for treating a liquid metal and particularly aluminum. 3,715,112, Cl. 266-34.00t.

Carley-Macauly, Kenneth Wallace; Hitchon, James Witham; and Moulton, Robert James, to United Kingdom Atomic Energy Authority. Electro-hydraulic crushing apparatus. 3,715,082, Cl. 241-1.000.

Carlisle Chemical Works, Inc.: *See—*
Stapfer, Christian H.; and D'Andrea, Richard W., 3,715,328.

Carls, Glen A.: *See—*
Harnish, Wayne N.; Sticker, Robert E.; and Carls, Glen A., 3,715,435.

Carnahan, George E. Fish cleaning device. 3,715,229, Cl. 17-66.000.

Carnes, Joseph J.; Green, James H.; and Heller, John H., to New England Institute, Inc., The. Process for increasing sedimentation rate of heterogeneous colloidal suspension systems. 3,715,305, Cl. 210-19.000.

Carre, Pierre: *See—*
Tanguy, Pierre; Carre, Pierre; and Le Boulbouech, Jean, 3,714,888.

Carreras, Luis Enrique, to Bendix Corporation, The. Gear and capstan guard for flight control servo. 3,715,103, Cl. 254-150.00r.

Carrier Corporation: *See—*
Kerklo, Philip, 3,715,176.

Carter, John H., to ACF Industries, Incorporated. Cap locking device for pneumatic hopper outlets. 3,715,053, Cl. 220-55.00r.

Cartwright, Thomas William: *See—*
Page, Robert Brian; and Cartwright, Thomas William, 3,715,622.

Cary, John W. Convertible trailer construction. 3,715,141, Cl. 296-23.00r.

Caspari, Georg K., to Burroughs Corporation. Variable drive apparatus. 3,715,021, Cl. 197-82.000.

Casto, John P., to Textron Inc. Cell to cabinet connector. 3,715,455, Cl. 174-48.000.

CCI Aerospace Corporation: *See—*
Johnson, Allan M., 3,715,287.

Celanese Corporation: *See—*
Campbell, Kenneth C.; and Rhinehart, Robert R., Jr., 3,715,416.
Jeffries, Samuel B., 3,715,320.

Central Vac International, Inc.: *See—*
Simonelli, Carl L., 3,714,765.

Chang, Robert Wu-Lin, to Bell Telephone Laboratories, Incorporated. Joint initial setting of attenuator coefficients and sampling time in automatic equalizers for synchronous data transmission systems. 3,715,665, Cl. 325-42.000.

Chelminski, Stephen V., to Bolt Associates, Inc. Automatically self-regulating variable-stroke, variable-rate and quiet-operating pile driver method and system. 3,714,789, Cl. 61-53.500.

Chemcell Limited: *See—*
Chopra, Sohinder Nath; and Turmel, Hilaire Marcel, 3,715,422.

Chenenko, Norman. Ski lock. 3,714,803, Cl. 70-58.000.

Cherry Electrical Products Corporation: *See—*
Long, Eric L., 3,715,545.

Chevron Research Company: *See—*
Bacskai, Robert, 3,715,335.
Mehmedbasich, Enver, 3,715,368.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Variable resistor device using a field transistor. 3,715,675, Cl. 330-28.000.

Chicago Metallic Corporation: *See—*
Jahn, Reinhardt H., 3,714,753.

Chicago Musical Instrument Co.: *See—*
Kniepkamp, Alberto E., 3,715,445.

Choate, William C.: *See—*
Smith, Stanley L.; Choate, William C.; and Masten, Michael K., 3,715,730.

Chopra, Sohinder Nath; and Turmel, Hilaire Marcel, to Chemcell Limited. Process for producing crinkled plastic ribbon. 3,715,422, Cl. 264-168.000.

Christiansen, Tore, to Munters, Carl George. Device for ventilation systems in spaces. 3,714,884, Cl. 98-40.00d.

Chugai Denkikogyo Kabushiki Kaisha: *See—*
Shibata, Akira, 3,715,070.

Ciba-Geigy AG: *See—*
Fairbairn, Geoffrey, 3,715,252.
Janiak, Stefan; and Dittrich, Volker, 3,715,436.

Ciba-Geigy Corporation: *See—*
Huebner, Charles Ferdinand, 3,715,348.
Traber, Walter; and Weiss, Anton G., 3,715,315.

Ciccarelli, Roger N., to Xerox Corporation. Electrostatically deformable thermoplastic layer containing a 1,4-dialkylamino-9,10-anthraquinone dye. 3,715,207, Cl. 96-1.500.

Ciccone, Thomas Q.: *See—*
Perkins, William E.; Schlack, Allen F.; and Ciccone, Thomas Q., 3,714,728.

Cincinnati Milacron Inc.: *See—*
Jankowski, Stanislaw; and Jackson, William John, 3,714,924.
Wise, Robert G., 3,715,646.

Cincinnati Milacron-Heald Corporation: *See—*
Uhtenwoldt, Herbert R.; and Deranian, Diran, 3,714,741.

Cirulis, Uldis: *See—*
Zacharias, Ellis M., Jr.; and Cirulis, Uldis, 3,715,709.

Clark Equipment Company: *See—*
Jenney, Asa R., 3,715,017.

Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, to Post Office, The. Apparatus for the laying or recovery of cables. 3,715,068, Cl. 226-108.000.

Clayton, Anthony Robert King; and Barber, Anthony Clifford, to Imperial Metal Industries (Kynoch) Limited. Superconductors. 3,715,243, Cl. 148-11.50r.

Clement, Carl J.: *See—*
Horine, David A.; and Clement, Carl J., 3,714,723.

Clements, Herbert Arthur: *See—*
Heybourne, Robert Howard; and Clements, Herbert Arthur, 3,715,019.

Clements, William C.; and Bootz, William, to Armco Steel Corporation. Energy absorbing device for the connections of segmented drive core. 3,714,787, Cl. 61-53.700.

Clermont, Louis-Philippe: *See—*
Bender, Frederick; Clermont, Louis-Philippe; and Powden, Alan Warren, 3,715,268.

Cleveland, Hardware & Forging Company: *See—*
Koehler, William F., 3,714,842.

Clymans, Augustien Maria, to U.S. Philips Corporation. Dosing apparatus. 3,715,058, Cl. 222-148.000.

Coburn, Herbert D.: *See—*
Kelly, Gilbert H.; and Coburn, Herbert D., 3,715,007.

Coe Laboratories: *See—*
Molnar, Eugene J., 3,715,331.

Coes, Loring, Jr., to Norton Company. Grinding control system. 3,714,715, Cl. 33-174.00r.

Cognigni, Franco: *See—*
Dinelli, Dino; and Cognigni, Franco, 3,715,277.

Cohn, Robert L. Simplified aircraft control system. 3,715,094, Cl. 244-83.00b.

Cole, Jean R., to Weber Marking Systems, Inc. Rotary label printing machine adjustable rotor cam for separating the printing couple. 3,714,893, Cl. 101-228.990.

Cole, Robert B.: *See—*
Bayes, Lowell D.; and Cole, Robert B., 3,715,458.

Colitti, Olindo A.: *See—*
Swotinsky, Jacob M.; Newman, Stephen; and Colitti, Olindo A., 3,715,248.

Collins, Henry F. Induction furnace with thermocouple assembly. 3,715,441, Cl. 13-26.000.

Collins, Neal H.: *See—*
Ender, Herman R; and Collins, Neal H., 3,714,766.

Colomb, Henry Octave, Jr.; and Trecker, David John, to Union Carbide Corporation. Radiation-convertible norbornene polymers. 3,715,342, Cl. 260-80.810.

Columbia Broadcasting System, Inc.: *See—*
Lover, Seth E., 3,715,008.

Combustion Engineering, Inc.: *See—*
Krawiec, Donald M., 3,715,275.

Comex Systems, Inc.: *See—*
Wallin, Gary P.; and Stapleford, Gary N., 3,715,726.

Commissariat a l'Energie Atomique: *See—*
Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, 3,715,703.

Commonwealth Scientific and Industrial Research Organization: *See—*
Henshaw, David Ernest; Knothe, Werner Emil Otto; and Stern, Lionel, 3,714,771.

Compagnie General d'Electricite: *See—*
Biet, Jean-Pierre, 3,715,684.

Compagnie Generale d'Electricite: *See—*
Aupoix, Marcel; and Moisson-Franckhauser, Francois, 3,715,453.

Computer Industries, Inc.: *See—*
Kan, Philip T., 3,715,731.

Computer Instruments Corporation: *See—*
Birnbaum, Burton H.; and Spier, Daniel J., 3,715,510.

Conco Inc.: *See—*
Latall, Roy C., 3,715,484.

Condon, Gordon L. Seat device for lifting, moving and lowering an invalid. 3,714,672, Cl. 4-185.001.

Confer, James O.; and McTaggart, George D., to Corning Glass Works. Ceramic article and method of making it. 3,715,220, Cl. 106-39.0dv.

Congdon, George L.: *See—*
Burkhalter, Robert; and Congdon, George L., 3,715,587.

Conrail AB: *See—*
Ahl, Nils Goran; and Larsson, Lars Herbert, 3,714,997.

Cook, James W.: *See—*
Michel, Donald E.; Fairbairn, Le Roy W.; and Cook, James W., 3,715,706.

Cooper, Erwin E.; and Kennedy, Howard V., to Texas Instrument, Incorporated. Optical scanner and real time image conversion system. 3,715,497, Cl. 178-6.800.

Cope, Richard P., Jr., to Stauffer Chemical Company. Brightener compositirn for acid copper electroplating baths. 3,715,289, Cl. 204-52.00r.

Cordell, Edward Geoffrey, to Normalair-Garrett (Holdings) Limited. Electronic programmer unit for burner control. 3,715,180, Cl. 431-25.000.

Cormany, Joseph L., Jr.: *See—*
Bhikuni, Roop S.; and Cormany, Joseph L., Jr., 3,714,772.

Corning Glass Works: *See—*
Bartholomew, Roger F.; and Garfinkel, Harmon M., 3,715,187.
Campbell, Larry E., 3,715,224.
Confer, James O.; and McTaggart, George D., 3,715,220.
Cotter, Douglas A., 3,715,619.
Love, Roy E.; and Westwig, Ralph A., 3,715,150.
Montierth, Max R., 3,715,196.
Szupillo, Raymond E., 3,715,244.

Cosden Oil & Chemical Company: *See—*
Brown, Rene Paul; Allison, Birt, Jr.; and D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky, 3,715,408.

Cosgrove, Richard E.; Krull, Irwin H.; and Mask, Charles A., to Beckman Instruments, Inc. Method and means for extending life of ion sensing electrode. 3,715,297, Cl. 204-195.00m.

Cosier, James Edwin Henry: *See—*

Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.

Costruba, Peter, to Angeles Metal Trim Co. Support structure for shelving. 3,714,748, Cl. 52-36.000.

Cottell, Eric Charles. Apparatus for carrying out ultrasonic agitation of liquid dispersions. 3,715,104, Cl. 259-1.00r.

Cotter, Douglas A., to Corning Glass Works. Storage cathode ray tube electron beam position indicator. 3,715,619, Cl. 315-10.000.

Cowans, Kenneth W.: *See—*
Fischel, Halbert; Dichiro, Anthony; and Cowans, Kenneth W., 3,714,942.

Craig, Philip V. C., to Telemation Inc. Color television camera encoder matrix with summation of two color video current signals and a constant current signal. 3,715,470, Cl. 178-5.400r.

Craig, Preston S.: *See—*
Berry, Walter L., Jr.; Nisonger, Dan P.; and Craig, Preston S., 3,715,379.

Crain, Donald L.: *See—*
Ray, Gardner C.; and Crain, Donald L., 3,715,410.

Craven, Donald: *See—*
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Crawford Fitting Company: *See—*
Shendure, Ashok S., 3,715,099.

Crenstein & Koppel Aktiengesellschaft: *See—*
Kollmann, Wolfgang; and Schwappach, Dieter, 3,715,039.

Cristofaro, Elvira: *See—*
Wuhrmann, Jean-Jacques; and Cristofaro, Elvira, 3,715,216.

Crivello, James V., to General Electric Company. Nitration of aromatic ring-containing compositions. 3,715,323, Cl. 260-47.0et.

Croce, Louis J.: *See—*
Barone, Bruno J.; and Croce, Louis J., 3,715,391.

Croce, Louis J.; and Barone, Bruno J., to Petro-Tex Chemical Corporation. Promotion of the oxidation of mononuclear aromatic compounds. 3,715,390, Cl. 260-523.00a.

Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, to Commissariat a l'Energie Atomique. Superconducting switch. 3,715,703, Cl. 338-32.00s.

Crown Zellerbach Corporation: *See—*
Muskopf, Billy J.; and Wiemann, Ronald W., 3,715,072.

CSF-Compagnie Generale de Telegraphie Sans Fil: *See—*
Vasseur, Jean-Pierre, 3,715,478.

Culbertson, Billy M.: *See—*
Slagel, Robert C.; and Culbertson, Billy M., 3,715,343.

Culver, Mark N.: *See—*
Byram, Robert J.; Culver, Mark N.; and Van Ostrom, David L., 3,715,005.

Cunnane, Jeffrey B., to Bancroft, H. S., Corporation. Integrated circuit die bonding apparatus. 3,715,258, Cl. 156-356.000.

Cunningham, Francis V.; and Miller, Cyril V., to Joslyn Mfg. and Supply Co. Fluid filled high voltage cable terminal apparatus. 3,715,449, Cl. 174-11.0bh.

Cunningham, Robert E.: *See—*
Privott, Wilbur J., Jr.; and Cunningham, Robert E., 3,715,418.
Privott, Wilbur J., Jr.; and Cunningham, Robert E., 3,715,419.

Curran, Bernard Edwin, to Robertson, W. H., Company. Fastening means for double-skin foam core building panel. 3,714,747, Cl. 52-309.000.

Curtiss-Wright Corporation: *See—*
Jones, Charles, 3,715,178.
Woodier, George H., 3,715,177.

Cutler-Hammer, Inc.: *See—*
Allport, Walter, 3,715,159.
Hyer, Frank S., 3,715,059.
Mattes, Lyle T., 3,715,641.
Piber, Earl T., 3,715,534.

Cutter Laboratories, Inc.: *See—*
Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,714,671.

Cutter, Larry I., to Kidde, Walter, & Company, mesne. Vault air valve. 3,714,910, Cl. 109-73.000.

Da Silva, Miguel. Lock and alarm. 3,714,922, Cl. 116-14.000.

Dahne, Martin: *See—*
Greinacher, Ekkehart; Fischer, Werner; and Dahne, Martin, 3,715,424.

Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, to Shell Oil Company. Marine mud hydrocarbon surveying. 3,714,811, Cl. 73-19.000.

Dalton, Thomas B., to Westram Corporation. Actuating device. 3,715,530, Cl. 200-47.000.

Danckert, Dieter: *See—*
Kosmider, Hans; and Danckert, Dieter, 3,715,202.

D'Andrea, Richard W.: *See—*
Stapfer, Christian H.; and D'Andrea, Richard W., 3,715,328.

Dane, Ernest Blaney, Jr. Undersea coring machine with means for separating samples. 3,714,996, Cl. 175-6.000.

Daniel, Peter James, to U.S. Philips Corporation. Methods of manufacturing semiconductor devices. 3,715,242, Cl. 148-11.500.

Daniels, John F.; and Pires, Antonio, to Sperry Rand Corporation. Auxiliary cutter means for an electric dry shaver. 3,714,710, Cl. 30-34.100.

Daniels, John F., to Sperry Rand Corporation. Cutter drive member means for electric dry shaver. 3,714,711, Cl. 30-43.920.

Dargent, Bruno M., to Hamilton Watch Company. Solid state watch incorporating large-scale integrated circuits. 3,714,867, Cl. 58-50.00r.

D'Ausilio, Robert F. Pre-formed electrical wiring system. 3,715,627, Cl. 317-99.000.

Davidson, Alastair Ritchie; and Percival, Eric Robert, to Reed International Limited. Manhole assemblies. 3,714,961, Cl. 137-363.000.

Davies, Timothy Muir: *See—*
Gibbs, Gilbert Leslie; and Davies, Timothy Muir, 3,715,073.

Davis, Andrew W.: *See—*
Goodson, Louis H.; Jacobs, William B.; and Davis, Andrew W., 3,715,298.

Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., to Wooster Brush Company, The. Diaphragm pump. 3,715,174, Cl. 417-311.000.

Dawson, Edward C., to United States of America, Air Force. Method and means for providing resolution level selection in a spectrum analyzer. 3,715,509, Cl. 179-15.55t.

Day, Christopher C.; and Grace, Wesley R., to American Optical Corporation. Analog signal selective-peak sampler system for blood pressure signals. 3,714,939, Cl. 128-2.05a.

Day, Gene F., to Varian Associates. Method for fixing of liquid toner developed electrographic images. 3,715,225, Cl. 117-21.000.

Day, John; and Thomas, David Kenneth, to United Kingdom of Great Britain and Northern Ireland, Supply Minister of Aviation, in her Britannic Majesty's Government of The. Preparation of nitrile silicone rubber. 3,715,411, Cl. 260-827.000.

Dayco Corporation: *See—*
Kleykamp, Donald L., 3,715,454.

De Bie, Edouard, to Metallurgie Hoboken-Overpett. Melting of metals. 3,715,203, Cl. 75-76.000.

De Grazio, Robert P.; and Robinson, Herbert N., to United States of America, Atomic Energy Commission. Separation of plutonium and uranium from holder. 3,715,204, Cl. 75-84.10r.

De Luca, Hector F., to Wisconsin Alumni Research Foundation, The. 24,25-Dihydro xycholecalciferol. 3,715,374, Cl. 260-397.200.

De Mesquita, Albert Hijman Gomes; and Bril, Alfred, to U.S. Philips Corporation. Cathode-ray tube containing cerium activated yttrium silicate phosphor. 3,715,611, Cl. 313-92.0ph.

De Vault, Robert Larry, to Abbott Laboratories. 2-Benzyl-1,4-dimethyl-5-hydroxymethyl-2, 5-epidithiapiperazine-3,6-dione and 2-benzyl-1, 4-dimethyl-5-hydroxymethyl-2,5-epitrithiapiperazine- 3,6-dione useful as anti-fungal agents. 3,715,352, Cl. 260-243.00r

Dedrick, Dallas S., to Weyerhaeuser Company. Process for kiln drying lumber by means of a predetermined drying rate. 3,714,716, Cl. 34-30.000.

Deere & Company: *See—*
Fletcher, Edward Horton, 3,714,999.
Hubbard, Arthur Lowell; and Sanderson, Leon Franklin, 3,714,767.
Schafer, Richard Arthur, 3,715,133.

Degener, Eberthart: *See—*
Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberthart; and Wagner, Kuno, 3,715,338.

Dektor Counterintelligence and Security: *See—*
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Delaney, Paul: *See—*
Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, 3,715,761.

Demag AG: *See—*
Raab, Stefan, 3,715,048.

Dembowski, Ronald J.; and Schuh, Theodore R., to Nalco Chemical Company. Urea- and melamine-formaldehyde bridging agents. 3,715,172, Cl. 260-3.000.

DeMent, Jack. Tellurian optoexplosive system including nuclear explosive light generator and target irradiation. 3,715,596, Cl. 250-84.000.

Demonte, Filippo; and Pipino, Luciano, to Olivetti, Ing., C., & C., S.p.A. Apparatus for recognizing graphic symbols. 3,715,724, Cl. 340-146.3ag.

Dendy, Joe B.; Thomson, Kenneth; and Morrison, Robert F., to Sperry Rand Corporation. Computer for use with ring laser rotational rate sensors. 3,715,562, Cl. 235-150.310.

Denney, Jerry W., to American Monitor Corporation. Cholesterol assay and reagents therefor. 3,715,188, Cl. 23-230.00b.

Dennison Manufacturing Company, mesne: *See—*
Arciprete, Genio R., 3,715,745.

Denny, Donald I. Load supporting carriage structure for trailers. 3,715,132, Cl. 280-405.00r.

Denton, Howard P., to Simplex Time Recorder Company. Alarm signalling apparatus. 3,715,743, Cl. 340-303.000.

Denton, Ronald T., to Ford Motor Company. Staged single venturi carburetor. 3,715,108, Cl. 261-50.00a.

Deranian, Diran: *See—*
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Detroit Edison Company, The: *See—*
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Di Fulvio, Anthony P.; and Wilson, William C., to Eastman Kodak Company. Adjustable sheet guide apparatus. 3,715,117, Cl. 271-61.000.

Dichiro, Anthony: *See—*
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Dick, A. B., Company: *See—*
Kievit, James M.; and Howe, James L., 3,715,725.

Diekman, John D., to Zoecon Corporation. Certain 2-aliphatic-thiobenzothiazoles. 3,715,363, Cl. 260-306.000.

Diersbock, Gunther Rudolph, to Timex Corporation. Amplitude control means for balance wheel oscillator. 3,714,773, Cl. 58-28.00b.

Diery, Helmut: *See—*
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Digby, James J., to Bendix Corporation, The. Engine starting gearing. 3,714,834, Cl. 74-6.000.

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Dimroth, Peter: *See—*
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Dinelli, Dino; and Cognigni, Franco. Preparation of fibers containing fibers. 3,715,277, Cl. 195-63.000.

Dion, Paul A.; and Hagarman, Paul O., to Polymetallurgical Corporation. Manufacture of clad metals. 3,714,701, Cl. 29-474.100.

Dischert, Robert Adams: *See—*
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Dobson, John C., to Formmet Corporation. Process of making a composite bearing race or the like. 3,714,694, Cl. 29-148.40r.

Docutel Corporation: *See—*
Hicks, John R.; and Bortzfield, William C., 3,715,569.

Dolan, Daniel D. Door for box lockers and the like. 3,714,739, Cl. 49-501.000.

Dominianni, Samuel J., to Lilly, Eli, and Company. Tetracyclic aziridine and method for its preparation. 3,715,362, Cl. 260-293.540.

Dorn, Conrad P., Jr.: *See—*
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Dorn, William E. Sewage disposal device. 3,714,914, Cl. 110-8.00r.

Dornemann, Peter L.; Radcliffe, Milton R.; Newton, Albert E.; and Eaton, Samuel E., Jr., to USM Corporation. Apparatus for binding sheets. 3,715,260, Cl. 156-477.00b.

D'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky: *See—*
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Dow Corning Corporation: *See—*
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Dowling, Donald J.; and Atwood, George R., to Texaco Inc. Induction logging apparatus having a common series element for nulling. 3,715,655, Cl. 324-6.000.

Drablowski, William J., to Wolverine Industries, Inc. Adjustable Christmas tree stand. 3,715,095, Cl. 248-46.000.

Draxler, James R., to Brunswick Corporation. Pulse generator for ignition systems. 3,715,650, Cl. 322-51.000.

Drebes, Friedrich-Wilhelm: *See—*
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Dreisin, Alexander, to Allis-Chalmers Corporation. Multiple plunger fuel control linkage. 3,714,936, Cl. 123-140.00r.

Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, to Sedriter Corporation. Sedimentation rate test instrument. 3,715,761, Cl. 346-33.00a.

Dresser Industries, Inc.: *See—*
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Drinkwater, John W.; and Evans, Albert, to Shell Oil Company. Electron capture identification apparatus. 3,714,812, Cl. 73-23.100.

Driscoll, Gary L.: *See—*
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Drohan, William A.; Valge, Juri; and Warner, David A., to United States of America, Air Force. Space vehicle system for determining earth's ultraviolet radiation limb. 3,715,594, Cl. 250-83.3uv.

Drost, Adrian D.; and Glanz, Ronald P., to Kimberly-Clark Corporation. Apparatus for cooling a traveling web of material. 3,714,720, Cl. 34-120.000.

Druth Packaging Corporation: *See—*
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Du Pont of Canada Limited: *See—*
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Dubuis, Robert: *See—*
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Ducellier & Cie: *See—*
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Dulat, Joseph, to United States Borax & Chemical Corporation. Method for treating surfaces of building materials. 3,715,228, Cl. 117-46.0fc.

Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., to Potlatch Forests, Inc. Method for producing a flat particle-faced plywood panel. 3,715,257, Cl. 156-299.000.

Dunlop Holdings Limited & Battelle Memorial Institute: *See—*
Zuppiger, Paul, 3,714,902.

Dunn, Thomas A., to Motorola Inc. Plastic encapsulation of semiconductor devices. 3,715,423, Cl. 264-250.000.

Durkan, Gerald. Fluidic digital pneumotachometer. 3,714,828, Cl. 73-194.00r.

Duve, John P., to Sunbeam Corporation. Electric toothbrush. 3,715,544, Cl. 200-157.000.

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Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., 3,715,006.

Eblovi, Roger, to General Signal Corporation. Rate decoder with active filters. 3,715,579, Cl. 246-187.00a.

Ebrahimi, Jalal, to Northern Electric Company Limited. Line circuit for key telephone system. 3,715,516, Cl. 179-18.0fa.

Ecodyne Corporation: *See—*
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Economics Laboratory Inc.: *See—*
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Edeus, James A., to National Manufacturing Co. Bifold door hardware. 3,714,679, Cl. 16-131.000.

Edwards, Albert, to Baker Perkins Limited. Feed arrangements for a mixer or mixer-conveyor unit. 3,715,106, Cl. 259-25.000.

Edwards, John Duncan: *See—*
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Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., to Cutter Laboratories, Inc. Tissue-type heart valve with a graft support ring or stent. 3,714,671, Cl. 3-1.000.

Ehlers, Kenneth W., to United States of America, Atomic Energy Commission. Plasma generator. 3,715,625, Cl. 317-4.000.

Ehrenfellner, Hubert, to MacMillan Bloedel Limited. Apparatus for orienting slender particles. 3,714,700, Cl. 29-419.000.

Eigenbrod, Lester Hurt, to Union Carbide Corporation. Intransit liquefied gas refrigeration system. 3,714,793, Cl. 62-62.000.

Elba Corporation: *See—*
Grupp, Walter Daniel, 3,715,155.

Electrohome Limited: *See—*
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Elfe, Thomas B., Jr., to Sperry Rand Corporation. High-impedance slow-wave propagation circuit having band width extension means. 3,715,616, Cl. 315-3.500.

Elgar Corporation: *See—*
Elliston, Robert O., 3,715,652.

Elks, Joseph, to Glaxo Laboratories Limited. Novel process for the preparation of 17α-hydroxy-pregna-1,4,9,(II)-triene-3,20-dione. 3,715,376, Cl. 260-397.450.

Elliott, Ernest A.; and Pasen, Randolph A., to Detroit Edison Company, The. Tubular deadend supports. 3,715,460, Cl. 174-158.00r.

Elliston, Robert O., to Elgar Corporation. High speed buck-boost alternating current regulator. 3,715,652, Cl. 323-45.000.

Eloranta, Vaito K.: *See—*
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Emerson Electric Co.: *See—*
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Emery Industries, Inc.: *See—*
Anninos, Athanasious P., 3,715,186.

Emmerson, John O. Welding programmer. 3,715,560, Cl. 219-131.00r.

Ender, Herman R; and Collins, Neal H. Machine for combining hay windrows. 3,714,766, Cl. 56-364.00.

Endo, Gen: *See—*
Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.

Endo Laboratories, Inc.: *See—*
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Energy Conversion Devices, Inc.: *See—*
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Engelhard Minerals & Chemicals Corporation: *See—*
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Engelsmann, Dieter; Hackenberg, Hubert; and Karl, Horst, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus for use with light generating devices which are responsive to mechanical impulses. 3,714,874, Cl. 95-11.50r.

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Enthone, Incorporated: *See—*
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Epstein, Joseph William; and Goldman, Leon, to American Cyanamid Company. Acyl derivatives of 10-methoxyibogamine. 3,715,361, Cl. 260-293.530.

Erb, George H., to American Velcro Inc. Method for the manufacture of a separable fastener. 3,715,415, Cl. 264-25.000.

Ernisse, Paul J.; and Reynolds, Robert L., to Eastman Kodak Company. Shutter control apparatus for photographic cameras. 3,714,873, Cl. 95-10.0ct.

Ernsberger, Glenn W.: *See—*
Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., 3,715,648.

Ernst, Max. Outboard driving device for toy and model ships. 3,714,919, Cl. 115-17.000.

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ESB Incorporated: *See—*
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Esposito, Frank J.; Pallas, Michael J.; and Martin, Robert W., to United States of America, Air Force. Unfurlable isotropic antenna. 3,715,759, Cl. 343-792.500.

Esso Production Research Company: *See—*
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European Atomic Energy Community (Euratom): *See—*
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Evans, Albert: *See—*
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Evans, Ralph E.; and Blower, Howard E., to Armco Steel Corporation. Drainage culvert. 3,714,786, Cl. 61-11.000.

Faccou, Armand L., to FMC Corporation. Pipe swivel joint with a cartridge-type packing unit. 3,715,134, Cl. 285-276.000.

Factory Mutual Research Corporation: *See—*
Livingston, William L., 3,714,964.
Livingston, William L., 3,714,988.

Fader, Seymour J. Copying and photographic contact printing machines. 3,715,160, Cl. 355-113.000.

Fairbairn, Geoffrey, to Ciba-Geigy AG. Method and apparatus for forming filament-wound articles. 3,715,252, Cl. 156-162.000.

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Fajans, Jack. Memory storage device and method of making the same. 3,715,734, Cl. 340-173.0lm.

Falconbridge Nickel Mines Limited: *See—*
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Farbenfabriken Bayer Aktiengesellschaft: *See—*
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Farmer, John J., III, to United States of America, Health, Education, and Welfare. Mini-test dish. 3,715,280, Cl. 195-103.500.

Fasco Industries, Inc.: *See—*
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Faulkner, Arthur M., to Plessey Company Limited, The. Jointing clips for insulated electric wires. 3,715,456, Cl. 174-84.00c.

Fedco, Inc.: *See—*
Morine, Richard L.; and Hokes, James J., 3,715,061.

Feely, Robert L., to Arbogast & Bastian, Inc. Bacon container. 3,715,218, Cl. 99-174.000.

Feigel, Harold J.; Reizenstein, Harry S.; and Bloch, Gilbert, to FMC Corporation, mesne. Device for feeding and folding the trailing top flap of a container for closing the container. 3,714,757, Cl. 53-75.000.

Feiner, Alexander; and Harding, Philip A., to Bell Telephone Laboratories, Incorporated. Error compensating optical detector apparatus and method. 3,715,733, Cl. 340-173.0lm.

Feit, Leo. Water resistant and water repellent paint compositions containing a latex of a vinyl ester polymer. 3,715,327, Cl. 260-17.00r.

Feldhoff, Heinrich: *See—*
Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, 3,714,686.

Feldmann, Fritz K., to Pacific Technica Corporation. Discarding sabot projectiles. 3,714,900, Cl. 102-93.000.

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Fichter, Barry S. Fluidic flushing mechanism. 3,714,954, Cl. 137-829.000.

Fielding, Gordon Wilder. Telephone handset shutter attachment. 3,715,525, Cl. 179-187.000.

Fifth Dimension Inc.: *See—*
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Figlin, Murray S.; and Boenisch, John R., to Ampeg Company, Inc., The. Clamp for a reverberation unit. 3,715,676, Cl. 333-30.00r.

Filbert, Wilbur C. Article support. 3,715,096, Cl. 248-223.000.

Filippi, Ernest A., to Special Devices, Inc. Scoring module. 3,714,899, Cl. 102-90.000.

Fillies, Friedrich; and Urban, Gunter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Electrofilter insulator without damaging dust deposits. 3,714,762, Cl. 55-5.000.

Fillion, Paul-Henri; and Guay, Viateur, to Hoplab Inc. Operating mechanism for vertically sliding door. 3,714,737, Cl. 49-360.000.

Finch, Derek James, to Marconi Company Limited, The. Television camera tube cooling arrangements. 3,715,491, Cl. 178-7.250.

Fine, Samuel: *See—*
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Finestone, Arnold B.; and Sims, Willard M., to Foster Grant Co., Inc. Process for preparing polyamides. 3,715,340, Cl. 260-78.00l.

Finestone, Paul Ian. Table units. 3,714,906, Cl. 108-64.000.

Finkle, Milton. Resilient firangible bumper guard. 3,715,138, Cl. 293-1.000.

Finsilver, Devora: *See—*
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Fiore, Jack C., to Motorola, Inc. Tuner pushbutton system with automatic band memory. 3,714,835, Cl. 74-10.330.

Fischel, Halbert; Dichiro, Anthony; and Cowans, Kenneth W., to Sub-Marine Systems, Incorporated. Cryogenic gas processing system. 3,714,942, Cl. 128-142.000.

Fischer, Werner: *See—*
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Fish, Richard D.: *See—*
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Fisher, Leslie George, to GKN Birfield Transmissions Limited. Universal joints. 3,714,797, Cl. 64-8.000.

Fitzgerald, William Vincent, Jr., to RCA Corporation. High voltage protection circuit. 3,715,492, Cl. 178-7.30r.

Fleischer, Paul Egon, to Bell Telephone Laboratories, Incorporated. Active RC delay equalizer. 3,715,679, Cl. 330-107.000.

Fleischer, Paul Egon, to Bell Telephone Laboratories, Incorporated. Active RC loss equalizer. 3,715,680, Cl. 330-107.000.

Fleming, Gordon R., to Energy Conversion Devices, Inc. Electroluminescent circuit or the like. 3,715,607, Cl. 307-287.000.

Fletcher, Edward Horton, to Deere & Company. Hydrostatic drive for vehicle. 3,714,999, Cl. 180-6.480.

Florjancic, Dusan, to Sulzer Brothers Ltd. Boiling water reactor plant. 3,715,271, Cl. 176-54.000.

Flory, Darrell L.: *See—*
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Flory, Donald M.; Moyer, Elton S.; and Naismith, Thomas D., to General Motors Corporation. Hydraulic power brake unit. 3,714,869, Cl. 91-434.000.

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Robiette, Alfred Gordon Evans, 3,715,440.
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Foster Wheeler Corporation: *See—*
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Foxboro Company, The: *See—*
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Freeman, Alfred B. Chord tone generator control system. 3,715,442, Cl. 84-1.010.
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Frick, Hans-Dieter: *See—*
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
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Frieder, Marcus A., to Bendix Corporation, The. Rotational rate regulator. 3,715,016, Cl. 188-184.000.
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Fujimoto, Sakae, to Kabushiki Kaisha Ricoh. Device for correcting the deflection of a large wide endless belt. 3,715,027, Cl. 198-184.000.
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Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, to Mitsubishi Jukogyo Kabushiki Kaisha. Descaling method for steel. 3,715,236, Cl. 134-2.000.
Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Method and machine for assembling slide fasteners of separable type. 3,714,698, Cl. 29-408.000.
Fumia, Arthur, Jr.: *See—*
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Funk, Robert M., to Bethlehem Steel Corporation. Method for controlling the grind in a single stage autogenous grinding mill. 3,715,083, Cl. 241-24.000.
Furbeck, Warren R.: *See—*
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Furukawa Electric Company Limited, The: *See—*
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Gaeng, Manfred; and Dimroth, Peter, to Badische Anilin- Soda-Fabrik Aktiengesellschaft. Dyes of the 2,4-dihydroxyquinoline series. 3,715,360, Cl. 260-288.00a.
Gafa, Salvatore: *See—*
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Gaines, George L.; and Legrand, Donald G. Electrical apparatus containing dielectric solution. 3,715,639, Cl. 317-258.000.
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Gedde, Erik, to American Can Company. Can end closure curl. 3,715,054, Cl. 220-67.000.
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Gibel, Stephen J. Multiple collimator muffler. 3,715,010, Cl. 181-50.000.
Gibson, Stan. Water float with paddle extension means. 3,714,921, Cl. 115-28.00r.
Gilbert, Dixie E., to Phillips Petroleum Company. Rapid heating of parison preforms. 3,715,109, Cl. 432-122.000.
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Macielinski, Jerzy Witold, 3,714,798.
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Glaze, Stanley G.; and Craven, Donald, to Hobson, H. M., Limited. Fuel supply systems for jet aircraft engines. 3,714,784, Cl. 60-241.000.
Gley, Paul R., to Rex Chainbelt Inc. Ski safety strap latch. 3,714,684, Cl. 24-230.000.
Gloeckler, Fred A., to Star Sprinkler Corporation. Flush type sprinkler. 3,714,989, Cl. 169-19.000.
Gloeckler, Fred A., to Star Sprinkler Corporation of Florida. Automatic heat detector. 3,715,700, Cl. 337-407.000.
Glorioso, Charles A., to Teletype Corporation. Programmable circuit and method. 3,715,608, Cl. 307-308.000.
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Gordon, Eugene Irving; and Maydan, Dan, to Bell Telephone Laboratories, Incorporated. High efficiency injection laser cavities. 3,715,685, Cl. 331-94.50c.
Gordon, Frank. Means for applying glue to articles. 3,715,259, Cl. 156-363.000.
Gordon, Travis Hill; Marino, Patrick John; and Pilc, Randolph John, to Bell Telephone Laboratories, Incorporated. Time-division switch providing time and space switching. 3,715,505, Cl. 179-15.0aq.
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Grenier, Wilfred J., to General Industries Inc. Sheet metal two-part sprinkler head and apparatus and process for making. 3,715,077, Cl. 289-200.000.
Griffin, Thomas Reuben, to Imperial Chemical Industries Limited. Homogenising. 3,715,105, Cl. 259-2.000.
Grobman, William, to Harris-Intertype Corporation. Sheet feeding apparatus. 3,715,115, Cl. 271-44.00a.
Grosseau, Albert, to Societe Anonyme Automobiles. Telescopic device for transmitting rotary movement. 3,714,841, Cl. 74-492.000.
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Grundy, Gary L., to Sperry Rand Corporation. Memory array readout with leading and trailing edges of the read signal. 3,715,737, Cl. 340-174.00m.
Grune, Per-Olof; Pucher, Walter; and Sandkvist, Hugo, to Allmanna Svenska Elektriska Aktiebolaget. Control means for pneumatically operated high voltage switching device. 3,715,542, Cl. 200-148.00r.
Grupp, Walter Daniel, to Elba Corporation. Audio visual display device. 3,715,155, Cl. 353-15.000.
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Gull, Frank Arthur, to Hawker Siddeley Dynamics Limited. Optical scanning equipment. 3,715,591, Cl. 250-83.30h.
Gundlach, Robert W., to Xerox Corporation. Electrical color masking for a photo electrophoretic imaging process. 3,715,209, Cl. 96-1.200.
Gunter, William D., Jr.; and Brown, Richard M. Multiple-pass reimaging optical system. 3,715,152, Cl. 350-202.000.
Haag, Herman; and Muller, Willy, said Haag assor. to said Muller, Willy. Remote call back telephone answering apparatus. 3,715,506, Cl. 179-6.00e.
Habert, Roger, to Ducellier & Cie. Centrifugal advance device for an ignition distributor. 3,715,528, Cl. 200-19.00r.
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Hall, Ronald B. Square edge sanding tool. 3,714,743, Cl. 51-392.000.
Hallen, Thor Oscar, to Tektronix, Inc. Temperature compensation of voltage controlled resistor. 3,715,609, Cl. 307-310.000.
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Hamashima, Yoshio, to Shionogi & Co., Ltd. Novel method for the preparation of 2 alpha, 3 alpha-epithio-alpha-steroids. 3,715,350, Cl. 260-239.500.
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Hamel, David O., to ESB Incorporated. Contact assembly for dry cell battery. 3,715,240, Cl. 136-134.00p.
Hamer, Edward A. G. Tubular osmotic membrane. 3,715,036, Cl. 210-321.000.
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Hammer, Alfred Paul; Entz, Alexis Charles; and Levaire, Claude. Superconductor structure, and method of making the same. 3,715,451, Cl. 174-15.00c.
Hammond, Joseph P., to United States of America, Atomic Energy Commission. Method for diffusion bonding refractory metals and alloys. 3,714,702, Cl. 29-494.000.
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Hanke, Edward Herman, to American Can Company. Easy opening container. 3,715,051, Cl. 220-54.000.
Hanlon, Thomas F. Color information on black and white film. 3,715,461, Cl. 178-5.20r.
Hanning, John R., to Aro Corporation, The. Sequential valve for rotary vane air motors. 3,714,969, Cl. 137-630.150.
Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek, Merle Edward, to International Business Machines Corporation. Capacitive deyboard electronics. 3,715,747, Cl. 340-365.000.
Harada, Tkuo; Hamazaki, Masabumi; and Isawa, Nobuyuki. Shock absorbing device for protecting a rider in a high speed vehicle such as automobile. 3,715,130, Cl. 280-150.0ab.
Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Method and apparatus for removing oil glands from fowl. 3,714,682, Cl. 17-11.000.
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Harnden, John D., Jr.; and Kornrumpf, William P., to General Electric Company. Induction cooking/warming appliance including vessel supporting means having an undulant surface and temperature sensing means associated with said surface. 3,715,550, Cl. 219-1.490.
Harned, John L.; and Stewart, Edwin E., to General Motors Corporation. Hydraulic anti-lock brake control system. 3,715,145, Cl. 303-21.00f.
Harnessed Energies, Inc.: *See—*
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Harrick, Nicolas J. Fluorescence spectrophotometry using multiple reflections to enhance sample absorption and fluorescence collection. 3,715,585, Cl. 250-71.00r.
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Haseltine, Marcus W., Jr.; and Driscoll, Gary L., to Sun Oil Company of Pennsylvania, mesne. Traction transmission containing lubricant comprising gem-structured polar compound. 3,715,313, Cl. 252-52.000.
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Henry, David W.; Hoff, Dale R.; and Patchett, Arthur A., to Merck & Co., Inc. N-(morpholino carbonyl)-1-lower alkyl-5-nitroimidazole-2-carboxamides. 3,715,355, Cl. 260-247.20a.
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Herring, Theodore C.; Bracht, Ernest F.; Ainslie, Robert E.; Todd, Eugene M.; and Franz, Joseph J., to United States of America, Army. Air-launched radio apparatus. 3,715,668, Cl. 325-112.000.

Herron, William L.: *See*—
Weisz, William; and Herron, William L., 3,714,678.

Heybourne, Robert Howard; and Clements, Herbert Arthur, to S.S.S. Patents Limited. Synchronous self-shifting clutches. 3,715,019, Cl. 192-67.00a.

Hiab-Foco Aktiebolag: *See*—
Marklund, Karl Georg Erland, 3,715,046.

Hicks, John J., to United States of America, Navy. Method and apparatus for measuring the intensity of atmospheric turbulence. 3,715,748, Cl. 343-5.00w.

Hicks, John R.; and Bortzfield, William C., to Docutel Corporation. Credit card automatic currency dispenser. 3,715,569, Cl. 235-61.11d.

Hieb, Harry L., to Kaiser Aluminum & Chemical Corporation. Basic refractory. 3,715,222, Cl. 106-58.000.

Highberg, Carle W.: *See*—
Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., 3,715,312.

Hildebrand, Bernard P.: *See*—
Haines, Kenneth A.; and Hildebrand, Bernard P., 3,715,482.

Hill, Warren R.: *See*—
Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., 3,715,006.

Himeno, Kinya: *See*—
Ohoshima, Nobumasa; Himeno, Kinya; and Tani, Norihiro, 3,715,589.

Hino, John B.: *See*—
Spaunburgh, Richard G.; and Hino, John B., 3,715,381.

Hirahara, Tsuneo: *See*—
Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, 3,715,279.

Hirata, Arthur Atsunobu, to Abbott Laboratories. Stabilized erythrocytes and methods therefor. 3,715,427, Cl. 424-3.000.

Hire, Charles John, to Fasco Industries, Inc. Thermostat with reset pin. 3,715,699, Cl. 337-348.000.

Hirsch, Donald; and Spaulding, David Adams, to Bell Telephone Laboratories, Incorporated. Adaptive DC restoration in single-sideband data systems. 3,715,670, Cl. 325-331.000.

Hiruma, Kenji; and Sugaya, Inawo, to Ricoh Co. Ltd. Printing head for thermal printer and method for manufacturing same. 3,715,564, Cl. 219-216.000.

Hitachi, Ltd.: *See*—
Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, 3,715,582.
Maekawa, Akiji; Munakata, Chusuke; and Saitou, Norio, 3,715,580.

Hitchon, James Witham: *See*—
Carley-Macauly, Kenneth Wallace; Hitchon, James Witham; and Moulton, Robert James, 3,715,082.

Hitzel, Hans: *See*—
Moebes, Erich; and Hitzel, Hans, 3,715,235.

Hobart Manufacturing Company, The: *See*—
Allen, Kenneth C.; and Boshinski, Edwin E., 3,714,998.

Hobdell, Michael R.: *See*—
Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, 3,715,296.

Hobson, H. M., Limited: *See*—
Glaze, Stanley G.; and Craven, Donald, 3,714,784.

Hoch, Robert; and Kollar, John, to Halcon International, Inc. Process for preparing glycol esters from olefinically unsaturated compounds. 3,715,389, Cl. 260-497.00r.

Hochmair, Erwin S.: *See*—
United States of America, National Aeronautics and Space Administration, 3,715,693.

Hoff, Dale R.: *See*—
Henry, David W.; Hoff, Dale R.; and Patchett, Arthur A., 3,715,355.
Mrozik, Helmut; and Hoff, Dale R., 3,715,395.

Hoff, Dale R., to Merck & Co., Inc. Nitroimidazole carboxamides. 3,715,364, Cl. 260-309.000.

Hoffman, Joseph K., to Air Reduction Company, Incorporated. Vinyl chloride-propylene copolymer grafted with butadiene, α-methacrylonitrile and optionally styrene. 3,715,413, Cl. 260-878.00r.

Hoffman, Joseph Willard, to AMP Incorporated. Cutting or grooving tool. 3,714,712, Cl. 30-95.000.

Hoffman, Norman Edwin, to AMP Incorporated. Cable coupling covering and moisture barrier. 3,715,459, Cl. 174-138.00f.

Hoffmann-La Roche Inc.: *See*—
Bauernfeind, Jacob Christopher; and Mitrovic, Milan, 3,715,433.
Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, 3,715,400.
Lindlar, Herbert; and Dubuis, Robert, 3,715,404.
Rey-Bellet, Gerald; Schwartz, Daniel Ernest; and Reiner, Roland, 3,715,357.
Stempel, Arthur; and Westley, John, 3,715,372.

Hofman, Wytze, to U.S. Philips Corporation. Electromagnetic switch having a flexible permanent magnet armature. 3,715,695, Cl. 335-229.000.

Hofmann, Detlef. Step-by-step transmission. 3,714,848, Cl. 74-822.000.

Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, to Licentia Patent-Verwaltungs-G.m.b.H. Rotatable neutron therapy irradiating apparatus. 3,715,597, Cl. 250-105.000.

Hogg, George W., to United States of America, Atomic Energy Commission. Fluidized bed production of uranium monocarbide and uranium monocarbide-uranium aluminide mixtures. 3,715,318, Cl. 252-301.10r.

Hokes, James J.: *See*—
Morine, Richard L.; and Hokes, James J., 3,715,061.

Holcombe, Edward L.; Calvert, Orville M.; and Kessel, William M., to Grace, W. R., & Co. Vacuumizing system. 3,714,754, Cl. 53-22.00b.

Hollebeck, Gustave L.: *See*—
Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, 3,714,814.

Hollenbaugh, Roger C.: *See*—
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Holmes, Ralph A.: *See*—
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Holtz, Carl F.: *See*—
Lestina, Gregory J.; Kent, Frank W.; and Holtz, Carl F., 3,715,208.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ozaki, Masaaki, 3,714,933.

Honeywell Inc.: *See*—
Nicholas, Merle E., 3,715,702.
Schmit, Francis M., 3,715,740.
Yu, Frank K., 3,715,727.

Honnold, George Herbert: *See*—
Campbell, Robert Riddle; Honnold, George Herbert; and Lefkowitz, Michael, 3,715,518.

Hoplab Inc.: *See*—
Fillion, Paul-Henri; and Guay, Viateur, 3,714,737.

Hopner, Emil: *See*—
Calfee, Richard W.; and Hopner, Emil, 3,715,474.

Horine, David A.; and Clement, Carl J., to Enrich. Hand held teaching machine. 3,714,723, Cl. 35-9.00a.

Horizons Incorporated: *See*—
Quaintance, Harold J., 3,715,211.

Horvath, Bertalan, to Phillips Petroleum Company. Chromium oxide polymerization catalyst. 3,715,321, Cl. 252-441.000.

Horwath, Tibor G., to United States of America, Army. Porous pipe acoustic sensor. 3,715,714, Cl. 340-15.000.

Hoshi, Hiroshi: *See*—
Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,715,063.

Houdek, Merle Edward: *See*—
Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek, Merle Edward, 3,715,747.

Houghton, George L.: *See*—
Montell, Joseph J.; and Houghton, George L., 3,714,915.

Houlihan, William J., to Sander-Wander, Inc. Diarylimidazo[2,1-a]isoindoles. 3,715,366, Cl. 260-309.000.

House, Bruce: *See*—
Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce, 3,715,119.

Howald, Werner E., to General Electric Company. Annular combustor systems. 3,714,778, Cl. 60-39.74r.

Howe, James L.: *See*—
Kievit, James M.; and Howe, James L., 3,715,725.

Howell, Eddie P.; Hardison, Jack E.; and Campbell, William M., to Atlantic Richfield Company. Geothermal exploration. 3,714,832, Cl. 73-432.00r.

Howson-Algraphy Limited: *See*—
Watkinson, Leonard J.; and Service, Anthony Peter, 3,715,210.

Hu, Shih-en; and Geyer, Jerome, to Esso Research and Engineering Company. Novel lubricating oil system and oil filter for internal combustion engines. 3,715,037, Cl. 210-501.000.

Hubbard, Arthur Lowell; and Sanderson, Leon Franklin, to Deere & Company. Crop harvester. 3,714,767, Cl. 56-208.000.

Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. Spiro aziridine-ethenoanthracene compounds. 3,715,348, Cl. 260-239.00e.

Huggett, Clayton M., to Susquehanna Corporation, The. Habitable combustion-suppressant atmosphere comprising air, a perfluoroalkane and optionally make-up oxygen. 3,715,438, Cl. 424-366.000.

Hughes Tool Company: *See*—
Nolley, Robert H., 3,714,993.

Hugle Industries, Inc.: *See*—
Moore, Arthur H., 3,714,704.

Hunicke, Wolfgang: *See*—
Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, 3,714,882.

Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, to Agfa-Gevaert Aktiengesellschaft. Machine for wet treatment of elongated strip-shaped carriers for light sensitive material. 3,714,883, Cl. 95-94.0r.
Hunsinger, Peter; and White, James C., to Propper Manufacturing Company, Inc. Apparatus for manufacturing slide covers. 3,715,067, Cl. 225-96.500.
Hurley, Eldon K.; Maule, Robert S.; Musso, Rocco C.; and Smith, Lowell E., to Hercules Incorporated. Chemical gas generating device for an automobile safety system. 3,715,131, Cl. 280-150.0ab.
Husch, Albert; Kemenes, Franz; and Pregel, Ludwig, to Ford Motor Company. Switch within a motor vehicle door lock mechanism. 3,715,536, Cl. 200-64.640.
Hyde, Peter John; and Reddish, Wilson, to Imperial Chemical Industries Limited. Method and apparatus for measuring the charge-time response of materials by applying a voltage step across the same. 3,715,656, Cl. 324-61.00r.
Hyer, Frank S., to Cutler-Hammer, Inc. Agitator assembly for particulate material hopper. 3,715,059, Cl. 222-199.000.
Hynes, Barry T.; Krall, George S.; and Krall, Michael G. Novel cleaning composition. 3,715,324, Cl. 252-529.000.
Iacobellis, Sam F., to North American Rockwell Corporation. Rocket engine nozzle with gas spike. 3,714,785, Cl. 60-258.000.
Ichikawa, Kiyoshi: *See—*
Nakahara, Yasuji; Ichikawa, Kiyoshi; and Kondo, Kunio, 3,715,412.
ICI America Inc.: *See—*
Wade, Charles G., 3,715,247.
Iino, Hideo, to SKB Arms Company. Gun barrel. 3,714,727, Cl. 42-79.000.
Ikrath, Kurt, to United States of America, Army. Method of repeating RF-borne signal across an earth barrier. 3,715,664, Cl. 325-9.000.
Imperial Chemical Industries, Limited: *See—*
Burton, Arthur, 3,715,264.
Griffin, Thomas Reuben, 3,715,105.
Hyde, Peter John; and Reddish, Wilson, 3,715,656.
Imperial Metal Industries (Kynoch) Limited: *See—*
Clayton, Anthony Robert King; and Barber, Anthony Clifford, 3,715,243.
Sindall, John Henry, 3,714,863.
Industrial Science & Technology, Agency of: *See—*
Takasaki, Yoshiyuki; and Kamibayashi, Akira, 3,715,276.
Instant Structures, Inc.: *See—*
Aitken, James B., 3,714,749.
Institute of Gas Technology: *See—*
Anderson, Philip J.; and Ng, Daniel Y. C., 3,714,909.
Interatom Internationale Atomreaktorbau GmbH: *See—*
Mehren, Franz, 3,715,269.
International Business Machines Corporation: *See—*
Blasbalg, Herman L., 3,715,508.
Calfee, Richard W.; and Hopner, Emil, 3,715,474.
Hall, Richard E., 3,715,722.
Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek; Merle Edward, 3,715,747.
Harr, Jerome D., 3,715,481.
Jones, Gardner D., Jr., 3,715,496.
Magill, Peter J.; McCurry, Robert E.; and Speicher, Charles A., 3,715,762.
Mercy, Brian R., 3,715,729.
Vogelsberg, Robert E., 3,715,573.
International Harvester Company: *See—*
Boyle, Ralph C.; and Paulius, Leonard, 3,715,704.
Rieser, Donald E., 3,714,991.
International Nickel Company, Inc., The: *See—*
Knapp, Burton Bower, 3,715,286.
International Paper Company, mesne: *See—*
Lee, Charles A.; and Furbeck, Warren R., 3,715,255.
International Standard Electric Corporation: *See—*
Fontaine, Bernard J.; and Alonso, Gabriel, 3,715,728.
International Telephone and Telegraph Corporation: *See—*
Goldan, Theodore J., 3,715,755.
Levine, Arnold M., 3,715,480.
Intertechnique S.A.: *See—*
Rosenstingl, Emmanuel, 3,715,584.
Thomas, Edward W.; and Rapkin, Edward, 3,715,586.
Irving, Alexander; and Priest, Reginald Alfred Francis, to National Research Development Corporation. Vehicle station keeping device. 3,715,721, Cl. 340-62.000.
Isawa, Nobuyuki: *See—*
Harada, Tkuo; Hamazaki, Masabumi; and Isawa, Nobuyuki, 3,715,130.
Ishigaki, Yoshio: *See—*
Tamaru, Hideshi; and Ishigaki, Yoshio, 3,715,469.
Ishigaki, Yukio: *See—*
Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.
Ishii, Yoshio: *See—*
Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.
Ishimura, Kazukiyo, to Nippon Gakki Seizo Kabushiki Kaisha. Wiring system between sound source circuits and keyer circuits in an electronic musical instrument. 3,715,443, Cl. 84-1.010.
Ishizuka, Hiroshi. Method for reducing chlorides and a device therefor. 3,715,205, Cl. 75-84.500.
Itek Corporation: *See—*
Kane, John R.; and Morse, Harry G., 3,715,214.
Marro, Dominic P., 3,715,620.
Ito, Shinya, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Hydraulic pressure differential switch with snap over leaf contact. 3,715,538, Cl. 200-82.00d.
Ito, Takamasa; and Makino, Tsutomu, to Sony Corporation. Graphic symbol display system including plural storage means and shared signal converter. 3,715,744, Cl. 340-336.000.
Ito, Takuo: *See—*
Komatsu, Noboru; Suzuki, Takatoshi; and Ito, Takuo, 3,715,206.
Itoh, Masaji, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard type wind msical instrument having removable mouthpiece securing removable air filter. 3,715,448, Cl. 84-375.000.
Iura, Yukio: *See—*
Hasegawa, Goro; and Iura, Yukio, 3,714,878.
Ivanhoe Research Corporation: *See—*
Saray, George B., 3,714,916.
Ivanoff, Alexander. Device for removing oil slicks. 3,715,034, Cl. 210-242.000.
Iwatsu Electric Co., Ltd.: *See—*
Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, 3,715,085.
Jackson, Dean B.; Stork, Edward S.; and Flory, Darrell L., to National Cash Register Company, The. Cam-and-linkage arrangement for simultaneous movement of multiple keystems connected to a common key. 3,715,023, Cl. 197-98.000.
Jackson, George Oliver, to United Kingdom Atomic Energy Authority. Nuclear reactors. 3,715,270, Cl. 176-38.000.
Jackson, William John: *See—*
Jankowski, Stanislaw; and Jackson, William John, 3,714,924.
Jacobs, William B.: *See—*
Goodson, Louis H.; Jacobs, William B.; and Davis, Andrew W., 3,715,298.
Jadow, B., and Sons, Inc.: *See—*
Jadow, Henry C., 3,714,713.
Jadow, Henry C., to Jadow, B., and Sons, Inc. Device for circular engraving. 3,714,713, Cl. 33-23.00k.
Jaffe, Mary S.; and Potter, Ralph M., to General Electric Company. Silicon carbide lamp mounted on a ceramic of poor thermal conductivity. 3,715,636, Cl. 317-234.00r.
Jahn, Reinhardt H., to Chicago Metallic Corporation. Concealed grid system. 3,714,753, Cl. 52-484.000.
Janda, Richard M., to North American Rockwell Corporation. Stocking and method of making same. 3,714,801, Cl. 66-170.000.
Janiak, Stefan; and Dittrich, Volker, to Ciba-Geigy AG. Formimidesters and pesticidal preparations containing them. 3,715,436, Cl. 424-304.000.
Janin, Raymond Marc Clement: *See—*
Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, 3,715,394.
Jankowski, Stanislaw; and Jackson, William John, to Cincinnati Milacron Inc. Dimension conversion indicator. 3,714,924, Cl. 116-115.500.
Jeddeloh Bros. Sweed Mills, Inc.: *See—*
Larson, Charles L., 3,715,118.
Jefferson Chemical Company, Inc.: *See—*
Burns, Simon Pierce; and Hartman, Henry Edmund, 3,715,284.
Schulze, Heinz, 3,715,365.
Jeffries, Samuel B., to Celanese Corporation. Reduction of nitrate ion concentration by formaldehyde treatment in the recovery of oxidation catalyst metals. 3,715,320, Cl. 423-24.000.
Jehle, Frederick S. Apparatus for determining an underinflated condition in pneumatic tires. 3,715,720, Cl. 340-58.000.
Jekat, Walter K., to Klein, Schanzlin & Becker Aktiengesellschaft. Drive shaft. 3,714,840, Cl. 74-421.00a.
Jenkner, Herbert: *See—*
Praetzel, Hans Eberhard; Neukirchen, Ernst; and Jenkner, Herbert, 3,715,383.
Jenney, Asa R., to Clark Equipment Company. Inching valve with bypass valve for rilling clutches. 3,715,017, Cl. 192-4.00a.
Jensen, Carl A.; and Wood, Lowell L., Jr. Radiant heating of gas streams. 3,715,110, Cl. 432-29.000.
Jensen, Norman P.: *See—*
Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., 3,715,375.
Jensen, Ole R.; and Jensen, Preben W. Indexible clutch mechanism. 3,714,837, Cl. 74-125.500.
Jensen, Preben W.: *See—*
Jensen, Ole R.; and Jensen, Preben W., 3,714,837.
Johns-Manville Corporation: *See—*
Sadler, Thomas Harry, 3,715,230.
Johnson, Allan M., to CCI Aerospace Corporation. Ion exchange demineralizing system. 3,715,287, Cl. 204-301.000.
Johnson, Bernard H.: *See—*
Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., 3,715,257.
Johnson, Dwight; and Mizuno, William G., to Economics Laboratory Inc. Treatment of water used in heat transfer equipment. 3,715,307, Cl. 210-58.000.
Johnson, Joe L.: *See—*
Johnson, Tom W.; and Johnson, Joe L., 3,714,958.
Johnson, Ray M. Circular waveguide microwave applicator. 3,715,555, Cl. 219-10.550.
Johnson, Tom W.; and Johnson, Joe L., to Sajar Plastics, Inc. Mixing valve assembly. 3,714,958, Cl. 137-315.000.

Johnson, Wallace J. S. Appratus for crushing fruit in an inert gas. 3,714,887, Cl. 99-239.000.

Jones, Charles, to Curtiss-Wright Corporation. Doweling construction for rotary engine housing. 3,715,178, Cl. 418-83.000.

Jones, Gardner D., Jr., to International Business Machines Corporation. Digital band-pass filter for a single circuit full duplex transmission system. 3,715,496, Cl. 178-58.000.

Josephson, Vernal, to United States of America, Air Force. Pulsed neutron source. 3,715,595, Cl. 250-84.500.

Joslyn Mfg. and Supply Co.: *See*—
Cunningham, Francis V.; and Miller, Cyril V., 3,715,449.

Jubenville, Arthur R. Trailer anti-fishtail control system. 3,715,003, Cl. 180-103.000.

Jungbluth, Ernest J.; Kavanaugh, Paul K.; and Gardner, Frederick H., to Stromberg-Carlson Corporation. Automatic transfer arrangement for telephone system. 3,715,503, Cl. 179-15.0bf.

Junkermann, Helmut; and Klotzer, Erhard, to Deutsche Gold- und Silber-Scheideanstalt vormal Roessler. Rubber stock composition for bonding to textile reinforcement containing a phenol-formaldehyde precursor wherein the formaldehyde percursor consists of alinear polyoxymethylene. 3,715,332, Cl. 260-41.50r.

Kabushiki Kaisha Ricoh: *See*—
Fujimoto, Sakae, 3,715,027.
Kadowaki, Tatsusuki; and Kurasawa, Makoto, 3,715,018.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Ito, Shinya, 3,715,538.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Ohta, Shuji, 3,715,014.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Komatsu, Noboru; Suzuki, Takatoshi; and Ito, Takuo, 3,715,206.

Kadowaki, Tatsusuki; and Kurasawa, Makoto, to Kabushiki Kaisha Ricoh. Clutch engaging and disengaging device. 3,715,018, Cl. 192-24.000.

Kahn, Paul: *See*—
Edwards, William Sterling; Kahn, Paul; and Goodenough, Samuel H., 3,714,671.

Kaiser Aluminum & Chemical Corporation: *See*—
Hieb, Harry L., 3,715,222.
Murphy, James M.; and Bolmer, Perce W., 3,714,792.

Kalajian, John. Adjustable easel. 3,715,097, Cl. 248-449.000.

Kalinowski, Walter: *See*—
Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, 3,715,296.

Kalle Aktiengesellschaft: *See*—
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Kamezawa, Yasutoki: *See*—
Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213.

Kamibayashi, Akira: *See*—
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Kaminski, William: *See*—
Brown, Earl Franklin; and Kaminski, William, 3,715,489.

Kan, Philip T., to Computer Industries, Inc. Microfilm plotter system. 3,715,731, Cl. 340-172.500.

Kane, John R.; and Morse, Harry G., to Itek Corporation. Rapid development process. 3,715,214, Cl. 96-66.0hd.

Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, to Merck & Co., Inc. N-acyl-α-hydrazino-β-(phenyl) hydrazino-propionitriles. 3,715,382, Cl. 260-465.00d.

Karato, Yoshiteru, to Shiba Electric Co., Ltd. Color television camera equipment. 3,715,466, Cl. 178-5.4st.

Karl, Horst: *See*—
Engelsmann, Dieter; Hackenberg, Hubert; and Karl, Horst, 3,714,874.

Karpenko, Irene M.: *See*—
Rylander, Paul N.; Karpenko, Irene M.; and Pond, George R., 3,715,397.

Karstedt, Bruce D., to General Electric Company. Platinum-vinylsiloxanes. 3,715,334, Cl. 260-46.5ua.

Kasper, Robert J.: *See*—
Balzer, Norbert R.; and Kasper, Robert J., 3,715,556.

Katzer, Johannes: *See*—
Sauer, Roland; Katzer, Johannes; and Stephany, Christian, 3,714,962.

Kaufman, Martin H., to United States of America, Navy. Process for recrystallizing diaminotrinitrobenzene. 3,715,398, Cl. 260-582.000.

Kavanaugh, Paul K.: *See*—
Jungbluth, Ernest J.; Kavanaugh, Paul K.; and Gardner, Frederick H., 3,715,503.

Kay, Charles. Building construction assembling and positioning apparatus. 3,714,696, Cl. 29-200.00p.

Keeley, Gordon, to Lucas, Joseph, (Industries) Limited. Distributor housing and plate assembly with rotatable clamping means. 3,715,531, Cl. 200-19.00r.

Keener, Everett L.: *See*—
Berkey, Earl R.; and Keener, Everett L., 3,714,806.

Kehoe, James M. Incinerator. 3,714,912, Cl. 110-8.00a.

Keir, Robin S., to United States of America, Navy. Water sampling device. 3,714,830, Cl. 73-425.40r.

Keizer, Jan: *See*—
McWade, John E.; Keizer, Jan; Moore, Wilcy I.; and Purcell, Ernest M., 3,715,741.

Kellner, Hans-Jurgen: *See*—
Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, 3,715,261.

Kelly, Calvin E.: *See*—
Hall, Marchand B.; Handler, Irving; and Kelly, Calvin E., 3,714,856.

Kelly, Calvin E., to United States Steel Corporation. Apparatus for printing and dispensing labels. 3,715,262, Cl. 156-541.000.

Kelly, Gilbert H.; and Coburn, Herbert D., to Texas Instruments, Incorporated. Gas cushion control for seismic gas explorer. 3,715,007, Cl. 181-.5nc.

Kelly, James Michael, to Bell Telephone Laboratories, Incorporated. Adaptive predictive speech signal coding system. 3,715,512, Cl. 179-1.0sa.

Kelson, Malcolm J., Sr. Rotary engine. 3,714,930, Cl. 123-8.270.

Kemenes, Franz: *See*—
Husch, Albert; Kemenes, Franz; and Pregel, Ludwig, 3,715,536.

Kendall, Louis F., Jr.: *See*—
Bredt, James H.; and Kendall, Louis F., Jr., 3,715,241.

Kenderi, Tibor, to Hajtomu es Felvonogyar. Method and apparatus for spraying powdered thermoplastic substances. 3,715,076, Cl. 239-8.000.

Kendrick, William D.; Frazier, Bruce J.; Freeman, Norman L.; and Ferguson, Lyndel G., to Halliburton Company. Apparatus for injecting one or more articles individually into a tubular flow path. 3,715,055, Cl. 221-75.000.

Kennedy, Howard V.: *See*—
Cooper, Erwin E.; and Kennedy, Howard V., 3,715,497.

Kent, Frank W.: *See*—
Lestina, Gregory J.; Kent, Frank W.; and Holtz, Carl F., 3,715,208.

Kerklo, Philip, to Carrier Corporation. Turbo machine rotor structure. 3,715,176, Cl. 416-198.000.

Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., to Westinghouse Electric Corporation. Technique for use of controlled current feedback transformers in power inverter apparatus. 3,715,648, Cl. 321-11.000.

Kessel, William M.: *See*—
Holcombe, Edward L.; Calvert, Orville M.; and Kessel, William M., 3,714,754.

Keto, August I.; and Manes, Robert J., to Westinghouse Electric Corporation. Rotary electrical switching contact assembly with hollow insulating arc barrier. 3,715,543, Cl. 200-151.000.

Kettner, Robert E., to Michigan Wheel Corporation. Foldable propeller. 3,715,171, Cl. 416-142.000.

Kidde, Walter, & Company, mesne: *See*—
Cutter, Larry I., 3,714,910.

Kieffer, Vernon E.; and Korski, Frank S., to Emerson Electric Co. Coil transfer and storage tool and machine for winding same. 3,714,973, Cl. 140-92.100.

Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, to Hoffmann-La Roche, Inc. Synthesis of hydroxycyclopenten-1-ones. 3,715,400, Cl. 260-586.00r.

Kievit, James M.; and Howe, James L., to Dick, A. B., Company. Address responsive controller for computer handling of peripheral equipment. 3,715,725, Cl. 340-147.000.

Kim, Yung Ki: *See*—
Pierce, Ogden R.; and Kim, Yung Ki, 3,715,387.

Kimberly-Clark Corporation: *See*—
Drost, Adrian D.; and Glanz, Ronald P., 3,714,720.

King, David M. Cigarette filter. 3,714,949, Cl. 131-10.500.

King-Seeley Thermos Co.: *See*—
Linstead, Robert S., 3,714,937.

Kinkel, Christian Frederick; and Phalin, Thomas Lawrence, to American Can Company. Full panel self-opening end closure. 3,715,052, Cl. 220-54.000.

Kipling, Barry John, to Pye Limited. Medical respirators. 3,714,941, Cl. 128-145.800.

Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, to Agfa-Gevaert Aktiengesellschaft. Rotary coil assembly with counter-balance for a electrical measuring instrument and method of making the same. 3,715,658, Cl. 324-154.0pb.

Kitai, Kiyoshi. Electric shutter operating mechanism. 3,714,880, Cl. 95-63.000.

Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, to Sekisui Kagoku Kogyo Kabushiki Kaisha. Process for producing a thermoplastic resin sheet having a color band. 3,715,420, Cl. 264-171.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Jekat, Walter K., 3,714,840.

Kleist, Robert A.; and Thorne, Robert L., to Peripheral Business Equipment, Inc. Data detection system. 3,715,738, Cl. 340-174.10h.

Kleykamp, Donald L., to Dayco Corporation. Hose construction. 3,715,454, Cl. 174-47.000.

Klippan GmbH: *See*—
Minolla, Horst, 3,715,144.

Klockner-Werke Aktiengesellschaft: *See*—
Kosmider, Hans; and Danckert, Dieter, 3,715,202.

Klotzer, Erhard: *See*—
Junkermann, Helmut; and Klotzer, Erhard, 3,715,332.

Knapp, Burton Bower, to International Nickel Company, Inc., The. Electrorefined nickel of controlled size. 3,715,286, Cl. 204-12.000.

Knebusch, George R.: *See*—
Fowell, Andrew J.; and Knebusch, George R., 3,714,795.

Kniepkamp, Alberto E., to Chicago Musical Instrument Co. Musical instrument having DC-keying circuit. 3,715,445, Cl. 84-1.130.

Knothe, Werner Emil Otto: *See*—

Henshaw, David Ernest; Knothe, Werner Emil Otto; and Stern, Lionel, 3,714,771.

Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, to Iwatsu Electric Co., Ltd. Device for supplying continuous sheet of paper from a rolled package used in a copying apparatus. 3,715,085, Cl. 242-56.00r.

Kobayashi, Shigehiko; Miyazaki, Kazuhide; and Yamamoto, Michiaki, to Mitsui Mining & Smelting Co., Ltd. Exhaust gas catalyst. 3,715,322, Cl. 252-454.000.

Koeber, Henry J., to Bell & Howell Company. Lens focusing mechanism with manual control. 3,715,161, Cl. 356-3.000.

Koehler, William F., to Cleveland, Hardware & Forging Company. Pivot mounting for bar of hand brake mechanism. 3,714,842, Cl. 74-505.000.

Koenig, Robert H., to Tapeswitch Corporation of America. Cushion seat switch sensor means. 3,715,541, Cl. 200-86.00r.

Kohmoto, Kohtaro: *See*—
Someya, Akira; and Kohmoto, Kohtaro, 3,715,612.

Koike, Toshio: *See*—
Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, 3,715,085.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Oshima, Shintaro; Nakagome, Yukio; and Fukata, Yasuo, 3,715,507.

Kolanowski, Jan: *See*—
Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.

Kollar, John: *See*—
Hoch, Robert; and Kollar, John, 3,715,389.

Kollmann, Wolfgang; and Schwappach, Dieter, to Crenstein & Koppel Aktiengesellschaft. Telescopic boom. 3,715,039, Cl. 212-55.000.

Komatinsky, Richard R.: *See*—
Michel, Donald E.; and Komatinsky, Richard R., 3,715,635.

Komatsu, Noboru; Suzuki, Takatoshi; and Ito, Takuo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Heat resisting alloys. 3,715,206, Cl. 75-170.000.

Kondo, Kunio: *See*—
Nakahara, Yasuji; Ichikawa, Kiyoshi; and Kondo, Kunio, 3,715,412.

Kopf, Paul: *See*—
Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, 3,715,658.

Koptelow, Leonid. Line drawing paint applicator. 3,714,675, Cl. 15-244.0ch.

Kornrumpf, William P.: *See*—
Harnden, John D., Jr.; and Kornrumpf, William P., 3,715,550.

Korski, Frank S.: *See*—
Kieffer, Vernon E.; and Korski, Frank S., 3,714,973.

Kosinski, Frank Joseph, to Gulf & Western Industries, Inc., mesne. Magnetic pickup for stringed musical instrument. 3,715,446, Cl. 84-1.150.

Koslow, Sidney; and Malone, James P. Sliding glass door retainer means. 3,714,738, Cl. 49-404.000.

Kosmider, Hans; and Danckert, Dieter, to Klockner-Werke Aktiengesellschaft. Method for desulphurizing pig iron. 3,715,202, Cl. 75-58.000.

Kostusiak, Karl H.; and Selke, Lynn A., to Eastman Kodak Company. Device for advancing a web of flexible strip material. 3,715,090, Cl. 242-188.000.

Kovacik, James W.: *See*—
Blanch, Charles H.; and Kovacik, James W., 3,715,526.

Kowalski, Slawomir; and Worden, Donald A., to Marotta Scientific Controls, Inc. Valve system for proportional flow control for fluid-operated motor. 3,714,868, Cl. 91-420.000.

Koziarz, Joseph J. Electrical fixture hanger. 3,714,744, Cl. 52-28.000.

Kraff, Lillian G. Musical water closet. 3,715,549, Cl. 200-172.00a.

Krall, George S.: *See*—
Hynes, Barry T.; Krall, George S.; and Krall, Michael G., 3,715,324.

Krall, Michael G.: *See*—
Hynes, Barry T.; Krall, George S.; and Krall, Michael G., 3,715,324.

Krapcho, John, to Squibb, E. R., & Sons, Inc. (Aminoalkoxy-benzylidene)-2H-benzothiazine-3(4H)-ones and related compounds. 3,715,353, Cl. 260-243.00r.

Krause, Gerhard, to Fernseh GmbH. Method and circuit arrangement for regulating the amplitude of the color synchronising signal. 3,715,462, Cl. 178-5.4cr.

Krawiec, Donald M., to Combustion Engineering, Inc. Bimetallic spacer grid arrangement. 3,715,275, Cl. 176-78.000.

Krogel, Christopher John, to Western Electric Company, Incorporated. Apparatus for surface dyeing the pulp insulation of wire. 3,714,927, Cl. 118-612.000.

Kruger, Peter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Solenoid switch, particularly cryogenic switch. 3,715,694, Cl. 335-177.000.

Krull, Irwin H.: *See*—
Cosgrove, Richard E.; Krull, Irwin H.; and Mask, Charles A., 3,715,297.

Kubacki, Edward Frank, to American Can Company. Machine for performing an operation on articles. 3,714,854, Cl. 82-101.00r.

Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, to Ricoh Co., Ltd. Heat-sensitive stencil sheet. 3,715,263, Cl. 161-33.000.

Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, to Ricoh Co., Ltd. Heat-sensitive stencil sheet. 3,715,267, Cl. 161-165.000.

Kubozoe, Morioki: *See*—
Akahori, Hiroshi; Kubozoe, Morioki; Furuya, Toshihiro; and Ueno, Sadayasu, 3,715,582.

Kuhl, Virgil F., to Motorola, Inc. Electronic chassis frame assembly with cabling for printed circuit boards. 3,715,630, Cl. 317-122.000.

Kuhling, Dieter; and Heitland, Hans-Joachim, to Henkel & Cie G.m.b.H. Method of activating per-compounds and solid activated per-compound compositions. 3,715,184, Cl. 8-111.000.

Kuhn, Russell P. Die stock (holder) and extension. 3,715,168, Cl. 408-239.000.

Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Agent for the dispelling of fog and process for their preparation. 3,715,319, Cl. 252-319.000.

Kulzer, Rudolf: *See*—
Bruggemann, Hans; and Kulzer, Rudolf, 3,714,904.

Kumiai Chemical Industry Co., Ltd.: *See*—
Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.

Kunsagi, Laszlo, to Foster Wheeler Corporation. Large ducts. 3,714,970, Cl. 138-109.000.

Kuo, Lai Che, to Thomas & Betts Corporation. Multicompartment connector. 3,715,705, Cl. 339-98.000.

Kurasawa, Makoto: *See*—
Kadowaki, Tatsusuki; and Kurasawa, Makoto, 3,715,018.

Kurita Water Industries Ltd.: *See*—
Yokozeki, Zenzo; and Hatta, Takeshi, 3,715,290.

Kurth, Carl Ferdinand, to Bell Telephone Laboratories, Incorporated. Adjustable equalizer having means responsive to the input and output signals of each equalizer section. 3,715,691, Cl. 333-18.000.

Kurz, Philip F.; and Nash, Leonard A., to Teletype Corporation. Electrostatically improvement in electro static printing. 3,715,219, Cl. 106-22.000.

La Forest, John P., to General Signal Corporation. Receiver for a frequency modulated overlay track circuit. 3,715,669, Cl. 325-320.000.

Lackey, Ronald H., to General Motors Corporation. Window assembly. 3,714,751, Cl. 52-400.000.

Laidlaw, Alexander Duncan Lindley: *See*—
Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Zumbrunn, Jean-Pierre, 3,715,309.

Lambrou, Nicholas S. Telephone dialing apparatus. 3,715,520, Cl. 179-90.00a.

Lancia, Frederick N.; and Liebert, Ralph C., to Liebert Corporation. Air control system. 3,714,980, Cl. 165-11.000.

Land, Edwin H.; Blinow, Igor; and Eloranta, Vaito K., to Polaroid Corporation. Reflex camera. 3,714,879, Cl. 95-42.000.

Lange, Gerhard, to Wafios Maschinenfabrik Wagner, Ficker & Schmid GmbH. Apparatus for producing chain links. 3,714,776, Cl. 59-23.000.

Larikka, Leo. Means for forming a hole in a tube or pipe wall and deforming the edge of the hole into an upstanding flange. 3,714,808, Cl. 72-325.000.

Larkin, William A., to M&T Chemicals Inc. Polyvinylchloride stabilization with mixtures of tin salts. 3,715,333, Cl. 260-45.75r.

Larralde, Edward: *See*—
Hanes, James W. E.; and Larralde, Edward, 3,714,995.

Larson, Charles L., to Jeddeloh Bros. Sweed Mills, Inc. Sheet separator and feeder assembly. 3,715,118, Cl. 271-26.00r.

Larson, Willis A., to Magic Dot, Inc. Touch sensitive electronic switch. 3,715,540, Cl. 200-159.00r.

Larsson, Lars Herbert: *See*—
Ahl, Nils Goran; and Larsson, Lars Herbert, 3,714,997.

Lass, James L.: *See*—
Venier, Dominic A.; Smith, Bart A.; and Lass, James L., 3,715,274.

Latall, Roy C., to Conco Inc. Duct scanning apparatus. 3,715,484, Cl. 178-6.800.

Latrobe Steel Company: *See*—
Schlatter, Rene, 3,715,201.

Laughlin, Charles R.; Hollenbaugh, Roger C.; and Allen, Walter K., to United States of America, National Aeronautics and Space Administration. Doppler compensation by shifting transmitted object frequency within limits. 3,715,663, Cl. 325-4.000.

Laughlin, Gordon J., to United States of America, Army. Wideband microwave power divider. 3,715,689, Cl. 333-9.000.

Lavering, Gordon R., to Varian Associates. Electrode support for arc lamps. 3,715,615, Cl. 313-204.000.

Lay, Ralph B.; and Olsen, Ogden R., to Hamilton Cosco, Inc. Folding high chair. 3,715,142, Cl. 297-39.000.

Le Boulbouech, Jean: *See*—
Tanguy, Pierre; Carre, Pierre; and Le Boulbouech, Jean, 3,714,888.

Le Fevre, Clyde E.; Hagan, James P.; and Owens, Ben H., to Micrographic Technology Corporation. Microfiche camera processor. 3,715,158, Cl. 355-27.000.

Le Peuvedic, Jean-Pierre: *See*—

Quichaud, Claude; Le Peuvedic, Jean-Pierre; and Tinchon, Jacques, 3,714,831.

Lechot, Andre. Automatic lathes. 3,714,853, Cl. 82-2.500.

Lee, Charles A.; and Furbeck, Warren R., to International Paper Company, mesne. Method of and apparatus for bas laying with flat mandrel. 3,715,255, Cl. 156-189.000.

Lee, Raymond, Organization, Inc., The: *See*—
O'Leary, Timothy J., 3,715,519.

Lee, Richard G., to Alves Photo Service, Inc. Strip cutter. 3,714,858, Cl. 83-211.000.

Lefkowitz, Michael: *See*—
Campbell, Robert Riddle; Honnold, George Herbert; and Lefkowitz, Michael, 3,715,518.

Legrand, Donald G.: *See*—
Gaines, George L.; and Legrand, Donald G., 3,715,639.

Lehman, William F.: *See*—
Ng, Wahling H.; Lehman, William F.; and Young, John P., 3,715,231.

Leich, Robert A., to Camdex Inc. Primer metering apparatus for ammunition loading machines. 3,714,860, Cl. 86-23.000.

Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., to Bausch & Lomb Incorporated. Apparatus for locating a variable optical focal point. 3,715,166, Cl. 356-125.000.

Lemahieu, Ronald Andrew: *See*—
Kierstead, Richard Wightman; and Lemahieu, Ronald Andrew, 3,715,400.

Leonard, Richard J.: *See*—
Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.

Lerch, Joseph B., to RCA Corporation. Threshold gate circuits employing field-effect transistors. 3,715,603, Cl. 307-211.000.

Lester, Arzell: *See*—
Martin, John E., Jr.; and Lester, Arzell, 3,715,281.

Lestina, Gregory J.; Kent, Frank W.; and Holtz, Carl F., to Eastman Kodak Company. Film containing bleach inhibitor and process therefor for producing color film with silver sound record. 3,715,208, Cl. 96-4.000.

Leuze, Rex E.: *See*—
Lloyd, Milton H.; Tallent, Othar K.; and Leuze, Rex E., 3,715,317.

Levaire, Claude: *See*—
Hammer, Alfred Paul; Entz, Alexis Charles; and Levaire, Claude, 3,715,451.

Levine, Arnold M., to International Telephone and Telegraph Corporation. Motion detection system. 3,715,480, Cl. 178-6.000.

Levy, Raymond L., to Varian Associates. Imaging device having a pivoting pressure pad for engaging and disengaging a web medium. 3,715,156, Cl. 355-16.000.

Lewis, John G., to Emerson Electric Co. Method of assembling a dynamo-electric machine. 3,714,705, Cl. 29-596.000.

Lewis, John R.: *See*—
Silberg, Paul A.; and Lewis, John R., 3,715,539.

Lewis, Tony E.; and Rodriguez, George, said Lewis assor. to said Rodriguez, George. Rotary stamping machine. 3,714,809, Cl. 72-326.000.

Libbey-Owens-Ford Company: *See*—
Wheat, Lawrence C.; and Tary, Orville L., 3,715,198.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Beneking, Heinz, 3,715,631.
Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, 3,715,597.
Putz, Ulrich, 3,715,602.

Licht, John J., to AMBAC Industries, Incorporated. Recorder apparatus using fluid support. 3,715,521, Cl. 179-100.20p.

Liddell, Arlyn G., to Eaton Corporation. Card mounting chassis. 3,715,628, Cl. 317-101.0dh.

Liebert Corporation: *See*—
Lancia, Frederick N.; and Liebert, Ralph C., 3,714,980.

Liebert, Ralph C.: *See*—
Lancia, Frederick N.; and Liebert, Ralph C., 3,714,980.

Liederbach, William Herman, to RCA Corporation. Method of manufacturing thick-film hybrid integrated circuits. 3,714,709, Cl. 29-626.000.

Lilly, Eli, and Company: *See*—
Dominianni, Samuel J., 3,715,362.
Smith, Milton R., 3,715,345.
Spry, Douglas O.; and Wright, Ian G., 3,715,347.
Sullivan, Hugh R.; and Billings, Ruth E., 3,715,359.

Limb, John Ormond; and Pease, Roger Fabian Wedgwood, to Bell Telephone Laboratories Incorporated. Bandwidth reduction system for use with video signals. 3,715,483, Cl. 178-6.800.

Lin, Chao-Han, to National Cash Register Company, The. Mark-forming record materials. 3,715,226, Cl. 117-36.200.

Lindlar, Herbert; and Dubuis, Robert, to Hoffmann-La Roche, Inc. Process for selective hydrogenation. 3,715,404, Cl. 260-642.000.

Lindstrand, Bengt: *See*—
Netterstedt, Sture; and Lindstrand, Bengt, 3,715,557.

Liner, Robert T., Jr.: *See*—
Weinbaum, Sheldon; and Liner, Robert T., Jr., 3,714,782.

Linkroum, Irving E., to Bendix Corporation, The. Three electrode spark gap apparatus. 3,715,614, Cl. 313-183.000.

Linoli, Gianni; and Mannucci, Enzo Sergio, to Miles Laboratories, Inc. Insoluble polymeric diazonium salt chromogen. 3,715,325, Cl. 260-2.20r.

Linstead, Robert S., to King-Seeley Thermos Co. Barbecue grill assembly. 3,714,937, Cl. 126-25.00r.

Linstromberg, William J.; and Nichols, Duane C., to Whirlpool Corporation. Drive motor-defrost timer for refrigerator. 3,714,794, Cl. 62-137.000.

Linz, Hans: *See*—
Martin, Horst G.; Glutz, Bernhard; and Linz, Hans, 3,715,421.

Liong Ho, Joseph Ping: *See*—
Hanson, Charles Christian; Liong Ho, Joseph Ping; and Houdek, Merle Edward, 3,715,747.

Little, Carl H., to Weber-Knapp Company. Counter-balance support. 3,714,680, Cl. 16-190.000.

Little, Samuel Woodrow. Apparatus for disengaging a fishhook. 3,714,732, Cl. 43-53.500.

Livers, Joseph A.: *See*—
Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., 3,715,006.

Livingston, John Edwin. Toy aircraft. 3,714,734, Cl. 46-76.00r.

Livingston, William L., to Factory Mutual Research Corporation. Double rate flow controller. 3,714,964, Cl. 137-513.300.

Livingston, William L., to Factory Mutual Research Corporation. Additive injection system. 3,714,988, Cl. 169-13.000.

Lloyd, Allen H., to Tech-Art, Inc. Switch device for counting flat articles. 3,715,529, Cl. 200-46.000.

Lloyd, Kenneth R. Fishing lead. 3,714,730, Cl. 43-17.200.

Lloyd, Milton H.; Tallent, Othar K.; and Leuze, Rex E., to United States of America, Atomic Energy Commission. Solvent extraction process for producing low-nitrate and large-crystal-size PuO_2 sols. 3,715,317, Cl. 252-301.10s.

Lloyd, Richard E.; and Wallgren, Linus E., to Pace, Incorporated. Electrical connector. 3,715,708, Cl. 339-177.00e.

Long, Eric L., to Cherry Electrical Products Corporation. Momentary push button switch with improved non-conductive cam for normally retaining movable leaf spring contacts in a non-operative position. 3,715,545, Cl. 200-159.00a.

Long, F. S., Manufacturing Company: *See*—
Wertheimer, Donald J.; Fish, Richard D.; and Holmes, Ralph A., 3,714,885.

Long, Hugh M., to Union Carbide Corporation. Porous fluid cooled electrical conductors. 3,715,452, Cl. 174-15.00c.

Longsworth, Ralph C., to Air Products and Chemicals, Inc. Cryogenic refrigeration system with dual circuit heat exchanger. 3,714,796, Cl. 62-514.000.

Loral Corporation, and: *See*—
Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., 3,715,618.

Louis, Joseph E.; and Schauer, George A., to Sundstrand Corporation. Hydrostatic-differential transmission. 3,714,846, Cl. 74-687.000.

Louvar, Joseph F.; and Nichols, Newlin S., to BASF Wyandotte Corporation. Removal of catalysts from polyols. 3,715,402, Cl. 260-613.00b.

Love, Roy E.; and Westwig, Ralph A., to Corning Glass Works. Photochromic fiber optic plate. 3,715,150, Cl. 350-96.00b.

Lover, Seth E., to Columbia Broadcasting System, Inc. Loudspeaker cabinet assembly and method. 3,715,008, Cl. 181-31.00b.

Low, William W.: *See*—
Morgan, Thomas R.; Low, William W.; Wamser, Christian A.; and Bruen, Charles P., 3,715,425.

Lucas, Joseph, (Industries) Limited: *See*—
Keeley, Gordon, 3,715,531.
Tregurthia, Steven John, 3,715,547.

Luke, Robert R.: *See*—
Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, 3,714,811.

Lundahl, Ezra C., Inc.: *See*—
Lundahl, Ezra Cordell, 3,715,129.

Lundahl, Ezra Cordell, to Lundahl, Ezra C., Inc. Suspension system. 3,715,129, Cl. 280-104.50r.

Lundman, Philip L. Conduit flusher. 3,714,951, Cl. 134-167.00c.

Lutz, Jean, to Societe Nationale des Petroles d'Aquitaine. Process for measuring wear on a drilling tool. 3,714,822, Cl. 73-104.000.

Ly, Manuel G.: *See*—
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,715,382.

Lynes, Dennis Joseph, to Bell Telephone Laboratories, Inc. Two-terminal NPN-PNP transistor memory cell. 3,715,732, Cl. 340-173.00r.

Lysher, Wayne M.: *See*—
Allen, Robert D.; and Lysher, Wayne M., 3,715,265.

Lyth, William; and Smith, Roy, to Eaton Corporation. Lubricant injector. 3,715,013, Cl. 184-7.00d.

M&T Chemicals Inc.: *See*—
Larkin, William A., 3,715,333.

Macielinski, Jerzy Witold, to GKN Birfield Transmissions Limited. Constant velocity universal joints. 3,714,798, Cl. 64-21.000.

MacInnes, John M.; and Saumsiegle, Robert W., to Owens-Illinois, Inc. Machine for assembling groups of containers. 3,714,756, Cl. 53-48.000.

Mackie, William L., to United States of America, Navy. Moistureproof microwave antenna. 3,715,756, Cl. 343-873.000.

MacMillan Bloedel Limited: *See*—
Ehrenfellner, Hubert, 3,714,700.

Madert, Franz Peter, to United States of America, Army. Frequency discriminator with variable center frequency. 3,715,681, Cl. 331-11.000.

Madonna, Michael A. Insect guard for sewer and drain openings. 3,714,733, Cl. 43-121.000.
Maekawa, Akiji; Munakata, Chusuke; and Saitou, Norio, to Hitachi, Ltd. Multi electron beam apparatus. 3,715,580, Cl. 250-49.5te.
Magerlein, Barney J., to Upjohn Company, The. Process for the preparation of lincomycin compounds. 3,715,346, Cl. 260-210.00r.
Magic Dot, Inc.: *See—*
Larson, Willis A., 3,715,540.
Magill, Peter J.; McCurry, Robert E.; and Speicher, Charles A., to International Business Machines Corporation. Method and apparatus for generating electrostatic images using ionized fluid stream. 3,715,762, Cl. 346-74.0es.
Magna-Graphics Corporation: *See—*
Bray, Andrew M., 3,714,692.
Makino, Tsutomu: *See—*
Ito, Takamasa; and Makino, Tsutomu, 3,715,744.
Malone, James P.: *See—*
Koslow, Sidney; and Malone, James P., 3,714,738.
Manassen, Joost; Vofsi, David; and Martan, Michael, to Yeda Research and Development Co., Ltd. Separation of alpha-naphthol. 3,715,403, Cl. 260-621.00a.
Mandiziak, Ronald S. Liquid skating assembly. 3,715,567, Cl. 219-437.000.
Manes, Robert J.: *See—*
Keto, August I.; and Manes, Robert J., 3,715,543.
Manifold & Phalor Machine Co.: *See—*
Manifold, Richard W., 3,715,183.
Manifold, Richard W., to Manifold & Phalor Machine Co. Gas burner especially useful for glazing glassware. 3,715,183, Cl. 431-328.000.
Mannucci, Enzo Sergio: *See—*
Linoli, Gianni; and Mannucci, Enzo Sergio, 3,715,325.
Maples, Travis N. Bowling ball refinishing machine. 3,714,703, Cl. 29-560.000.
Mar, Michael W. Process for separating water from pollutants in water. 3,715,306, Cl. 210-21.000.
Marconi Company Limited, The: *See—*
Finch, Derek James, 3,715,491.
Marcy, Raymond, to Thomson-CSF. Electro-optical system for controlling the attitude of a stage mounted on a carriage sliding along a parallel bench. 3,715,599, Cl. 250-231.00r.
Mariani, Louis J. Depth marker for a fish line. 3,714,923, Cl. 116-114.000.
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Mattson, Larry L. Helicopter supported aerial fire suppressant applicator. 3,714,987, Cl. 169-2.00a.
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Mc Taggart, James E., to Teledyne, Inc. Color emphasis circuit for TV receivers. 3,715,472, Cl. 178-5.4he.
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Meier, Leon G. Stubble mulcher device. 3,714,992, Cl. 172-175.000.
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Ng, Wahling H.; Lehman, William F.; and Young, John P., to United States of America, Army. Storage of liquid hydrazine rocket fuels. 3,715,231, Cl. 117-71.00m.
Nicholas, Merle E., to Honeywell Inc. Relative humidity sensor. 3,715,702, Cl. 338-35.000.
Nichols, Duane C.: *See—*
Linstromberg, William J.; and Nichols, Duane C., 3,714,794.
Nichols, Newlin S.: *See—*
Louvar, Joseph F.; and Nichols, Newlin S., 3,715,402.
Nicko, Stanley. Fluid treatment devices. 3,715,032, Cl. 210-133.000.
Nicolson, Alexander M., to Sperry Rand Corporation. Non-destructive electromagnetic energy testing of web material. 3,715,667, Cl. 324-58.50b.
Nielsen, Anker J., Jr.: *See—*
Morse, Lynn H.; and Nielsen, Anker J., Jr., 3,714,802.
Nienstedt, William H.: *See—*
Truesdell, Robert E.; and Nienstedt, William H., 3,715,256.
Nier, Johannes. Semiconductor unit with integrated circuit. 3,715,633, Cl. 317-234.00r.
Nighohossian, Sarkie; and Tobin, John J., Jr., to United States of America, Treasury. Qualitative analysis device. 3,715,189, Cl. 23-259.000.
Nihon Denshi Kabushiki Kaisha: *See—*
Matsuda, Hisashi, 3,715,581.
Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Diazo-type multicolor reproduction. 3,715,213, Cl. 96-49.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Chibana, Masanobu, 3,715,675.
Ishimura, Kazukiyo, 3,715,443.
Itoh, Masaji, 3,715,448.
Ohno, Junji, 3,715,447.
Nippon Oil Company, Limited: *See—*
Misono, Akira; and Ogata, Ikuei, 3,715,405.
Nippon Steel Corporation: *See—*
Watanabe, Tetsuo; and Hashirizaki, Shinya, 3,715,476.
Nisonger, Dan P.: *See—*
Berry, Walter L., Jr.; Nisonger, Dan P.; and Craig, Preston S., 3,715,379.
Nix, Andrew B.: *See—*
Schultz, Seiford F.; and Nix, Andrew B., 3,715,414.
Nogami, Sumitaka; Saito, Shizuko; and Okada, Tooru, to Asahi Kasei Kogyo Kabushiki Kaisha. Self-thermoset unsaturated polyesters and method for preparation thereof. 3,715,330, Cl. 260-40.00r.
Nolley, Robert H., to Hughes Tool Company. Valving tube subassembly for percussion bit. 3,714,993, Cl. 173-78.000.
Noordenbos, Pieter Klaas. Process and apparatus for setting a flexible elongate body in a particular form. 3,714,855, Cl. 83-1.000.

Norcross, James E.; and Garwood, George, to Arcos Corporation. Vertical welding machine having swinging equipment head. 3,715,559, Cl. 219-126.000.

Nordin, Robert W., to Teletype Corporation. Wire recording and mechanism therefor. 3,715,020, Cl. 197-1.00r.

Noren, Don W., to Noren Products Inc. Heat shield assembly. 3,714,981, Cl. 165-47.000.

Noren Products Inc.: *See—*
Noren, Don W., 3,714,981.

Norland Corporation: *See—*
Burkhalter, Robert; and Congdon, George L., 3,715,587.
Rose, Frederick A., 3,715,588.

Normalair-Garrett (Holdings) Limited: *See—*
Cordell; Edward Geoffrey, 3,715,180.

North American Rockwell Corporation: *See—*
Iacobellis, Sam F., 3,714,785.
Janda, Richard M., 3,714,801.
Miller, Darrow L., 3,714,817.
Miller, Dorrow L., 3,714,816.
O'Donnell, Cedric F.; and Pulliam, George R., 3,715,736.
Shaheen, Joseph M.; and Simone, John, 3,714,707.

North, William L.; and Eubank, George S., to Forenta, Limited. Garment finishing apparatus. 3,715,064, Cl. 223-57.000.

Northern Electric Company Limited: *See—*
Ebrahimi, Jalal, 3,715,516.

Norton Company: *See—*
Coes, Loring, Jr., 3,714,715.

Notkr, Michael, to Druth Packaging Corporation. Fiber board table. 3,714,908, Cl. 108-157.000.

Nowak, Robert M.; Woo, James T. K.; and Heinert, Dietrich H., to Dow Chemical Company, The. Copolymers of vinyl amine and vinyl alcohol as flocculants. 3,715,336, Cl. 260-77.5bb.

Nukem Nuklear-Chemie und- Metallurgie, GmbH: *See—*
Pirk, Hans; and Tillessen, Ulrich, 3,714,978.

Nusonics, Inc., mesne: *See—*
Zacharias, Ellis M., Jr.; and Cirulis, Uldis, 3,715,709.

Nutt, Wendell Glenn, to Bell Telephone Laboratories, Incorporated. System for maintaining low relative humidity in closures. 3,715,565, Cl. 219-274.000.

Ochs, Charles S.: *See—*
Roberts, Cecil P.; and Ochs, Charles S., 3,714,760.

O'Connor, Robert F., to Textron Inc. Pneumatically actuated fastener driving device with improved sleeve valve for controlling the pressure beneath the drive piston. 3,715,069, Cl. 227-130.000.

Odec Computer Systems, Inc.: *See—*
Perry, Richard Anthony, 3,714,892.

O'Donnell, Cedric F.; and Pulliam, George R., to North American Rockwell Corporation. Magnetic bubble domain system. 3,715,736, Cl. 340-174.0tf.

Oertel, Harald: *See—*
Traubel, Harro; and Oertel, Harald, 3,715,326.

Offermann, Bernd Peter: *See—*
Hofmann, Ernst-Gunther; Meyerhoff, Klaus; Offermann, Bernd Peter; and Barthel, Rolf, 3,715,597.

Ofner, Max, to SFB Spezial-Filterbau M. Ofner K.G. Apparatus for electrostatically coating the surfaces of articles with pulverulent materials. 3,714,926, Cl. 118-603.000.

Ogata, Ikuei: *See—*
Misono, Akira; and Ogata, Ikuei, 3,715,405.

Ogawa, Morimasa; and Gono, Kiyoshi, to Matsushita Electric Industrial Co. Ltd. High-frequency heating equipment. 3,715,553, Cl. 219-10.550.

Ohio University, The President and Board of Trustees of the: *See—*
Garrett, Patrick H., 3,715,752.

Ohno, Junji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with a keyboard device capable of producing special musical effects upon key depression. 3,715,447, Cl. 84-1.240.

Ohoshima, Nobumasa; Himeno, Kinya; and Tani, Norihiro, to Matsushita Electric Industrial Co., Ltd. Electromagnetic radiation image displaying panel. 3,715,589, Cl. 250-80.000.

Ohta, Shuji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Industrial truck. 3,715,014, Cl. 187-9.000.

Okada, Takashi: *See—*
Takise, Tadashi; and Okada, Takashi, 3,715,488.

Okada, Takashi, to Sony Corporation. Camera tube residual smage elimination apparatus. 3,715,490, Cl. 178-7.200.

Okada, Tooru: *See—*
Nogami, Sumitaka; Saito, Shizuko; and Okada, Tooru, 3,715,330.

Okkonen, Oliver G., to Rowe International Inc. Post validator for bill acceptor. 3,715,031, Cl. 209-75.000.

Okumoto, Masanori: *See—*
Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.

Olcott, Eugene L., to Susquehanna Corporation, The. Composite materials. 3,715,253, Cl. 156-175.000.

O'Leary, Timothy J., to Lee, Raymond, Organization, Inc., The. Device for converting table telephone to wall telephone. 3,715,519, Cl. 179-100.00c.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Demonte, Filippo; and Pipino, Luciano, 3,715,724.
Ollearo, Giorgio, 3,715,167.

Ollearo, Giorgio, to Olivetti, Ing., C., & C., S.p.A. Control device for a boring tool holder of machine tools. 3,715,167, Cl. 408-149.000.

Olsen, Arthur A., to General Electric Company. Spring plate contact and support for a lightning arrester sparkgap assembly and associated grading resistors. 3,715,626, Cl. 317-68.000.

Olsen, Ogden R.: *See—*
Lay, Ralph B.; and Olsen, Ogden R., 3,715,142.

Olson, Charles Langdon; Monahan, John Francis; and Dischert, Robert Adams, to RCA Corporation. Video signal noise-limiting apparatus. 3,715,477, Cl. 178-5.40r.

Olson, Glenn V. Punch riveter for joining metals. 3,714,688, Cl. 29-21.100.

Olympia Werke AG: *See—*
Rix, Albert; Werner, Georg; and Fuchs, Hans, 3,715,022.

Omark Industries, Inc.: *See—*
Sandberg, Gary K., 3,715,137.
Tupper, Myron D., 3,714,859.

Omron Tateisi Electronics Co.: *See—*
Hatand, Isao, 3,715,746.

O'Neal, Larry. Inflatable dock seal. 3,714,745, Cl. 52-2.000.

Opti-Holding A.G.: *See—*
Frohlich, Alfons; Cappel, Marie-Luise; and Stubiger, Ernst, 3,714,683.

Orbit Manufacturing Company: *See—*
Shriver, Charles S., 3,714,982.

Orser, Harvey E. Plug insertion tool. 3,714,851, Cl. 81-15.700.

Osborn, Claiborn Lee: *See—*
Sandner, Michael Ray; and Osborn, Claiborn Lee, 3,715,293.

Oshima, Shintaro; Nakagome, Yukio; and Fukata, Yasuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Bilateral start-stop transmission system for digital information. 3,715,507, Cl. 179-15.0by.

Ott, C. Dr., & Comp. G.m.b.H.: *See—*
Pries, Erich E.; Errgang, Karl; and Drebes, Friedrich-Wilhelm, 3,715,282.

Ott, Erich. Analog-type constant-current regulator. 3,715,651, Cl. 323-4.000.

Ottaway, Herbert J. Engine powered jumping stick. 3,715,000, Cl. 180-8.00r.

Ottestad, Jack B. Tool fixture. 3,714,866, Cl. 91-216.00r.

Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Switchable current controlling device with inactive material dispersed in the active semiconductor material. 3,715,634, Cl. 317-234.00r.

Owen, Charles L. Handy tire rack. 3,715,066, Cl. 224-42.240.

Owen, Robert E. Hydraulically operated railroad car door. 3,714,735, Cl. 49-220.000.

Owens, Ben H.: *See—*
Le Fevre, Clyde E.; Hagan, James P.; and Owens, Ben H., 3,715,158.

Owens-Illinois, Inc.: *See—*
MacInnes, John M.; and Saumsiegle, Robert W., 3,714,756.

Oxy Metal Finishing Corporation: *See—*
Sulfaro, Andrew N.; and Stein, Alfred H., 3,715,308.

Ozaki, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Automatic temperature control device for intake air of an internal combustion engine. 3,714,933, Cl. 123-122.000.

Pace, Incorporated: *See—*
Lloyd, Richard E.; and Wallgren, Linus E., 3,715,708.

Pachter, Irwin J.: *See—*
Schoen, Karl; and Pachter, Irwin J., 3,715,354.

Pacific Lighting Service Company: *See—*
Peck, Ralph E., 3,714,791.

Pacific Technica Corporation: *See—*
Feldmann, Fritz K., 3,714,900.

Packard, James R.: *See—*
Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., 3,715,162.

Paddington, Arthur Loftus, to British Ropes Limited. Sealing means for pipes. 3,715,135, Cl. 285-379.000.

Pagdin, William G.; and Risley, Robert F., to Schiltz, Jos., Brewing Company. Open flap detector for filled cartons. 3,714,759, Cl. 53-78.000.

Page, Robert Brian; and Cartwright, Thomas William, to Thorn Electrical Industries Limited. Metal-halide discharge lamps. 3,715,622, Cl. 315-60.000.

Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., to Loral Corporation, and and Thomas Electronics, Inc. Vidicon viewed storage tube in which the newest line of information is displayed on the upper most portion of the tube. 3,715618, Cl. 315-10.000.

Pallas, Michael J.: *See—*
Esposito, Frank J.; Pallas, Michael J.; and Martin, Robert W., 3,715,759.

Pallotto, Nicholas. Covering for riser or the like. 3,714,750, Cl. 52-728.000.

Palmer, Robert M. Hand brace. 3,714,940, Cl. 128-77.000.

Palmer, William B., to TRW Inc. Rigid collapsible dish structure. 3,715,760, Cl. 343-915.000.

Panousis, Peter Theodore; and Waggener, Herbert Atkin, to Bell Telephone Laboratories, Incorporated. Etching Si_3N_4. 3,715,249, Cl. 156-17.000.

Pansky, Ben: *See—*
Yanof, Howard M.; Pansky, Ben; and Poff, James S., 3,714,943.

Parenti, Joseph A. Belt hole cutter. 3,714,690, Cl. 29-105.00a.

Paris, Hugh P. Transit concrete mixer and method of mixing concrete components. 3,715,107, Cl. 259-148.000.

Park, Won Kil; and Regoli, Domenico, to University de Sherbrooke. System for the solid-phase peptide synthesis. 3,715,190, Cl. 23-252.00r.

Park-Ohio Industries, Inc.: *See—*
Balzer, Norbert R.; and Kasper, Robert J., 3,715,556.

Parker, Leland L., to United States of America, Navy. Directed warhead. 3,714,897, Cl. 102-56.000.

Parkman, Malcolm F., to Varian Associates. Sealed high-pressure arc lamp and socket therefor. 3,715,613, Cl. 313-113.000.

Parry, John F. W., to United States of America, Air Force. Tethered chaff strand countermeasure with trailing end kite. 3,715,754, Cl. 343-18.00b.

Pasek, James E.; Rehfeld, Frederick L. J.; and Thompson, William B., to General Motors Corporation. Automatic engine cranking system. 3,715,004, Cl. 180-103.000.

Pasen, Randolph A.: *See—*
Elliott, Ernest A.; and Pasen, Randolph A., 3,715,460.

Pasetti, Adolfo: *See—*
Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, 3,715,378.

Patchett, Arthur A.: *See—*
Henry, David W.; Hoff, Dale R.; and Patchett, Arthur A., 3,715,355.

Patterson, Joseph M., to FMC Corporation. Pickup and separating machine. 3,714,768, Cl. 56-328.00r.

Paulius, Leonard: *See—*
Boyle, Ralph C.; and Paulius, Leonard, 3,715,704.

Payne, William E. Linkage mechanism for rider propelled toys. 3,715,125, Cl. 280-1.194.

Pearlman, Alan R., to Tonus, Inc. Switching system for keyboard. 3,715,444, Cl. 84-1.010.

Pease, Roger Fabian Wedgwood: *See—*
Limb, John Ormond; and Pease, Roger Fabian Wedgwood, 3,715,483.

Peck, Edmond C. Device for putting on stockings and socks. 3,715,065, Cl. 223-111.000.

Peck, Ralph E., to Pacific Lighting Service Company. Vapor freezing type desalination method and apparatus. 3,714,791, Cl. 62-58.000.

Pellerin, Roy F.: *See—*
Strickler, Melvin D.; and Pellerin, Roy F., 3,714,820.

Peltola, Fred R. Child's slide. 3,715,120, Cl. 272-56.50r.

Pennsylvania Engineering Corporation: *See—*
Persson, John A., 3,715,439.

Percival, Eric Robert: *See—*
Davidson, Alastair Ritchie; and Percival, Eric Robert, 3,714,961.

Peripheral Business Equipment, Inc.: *See—*
Kleist, Robert A.; and Thorne, Robert L., 3,715,738.

Perkin-Elmer Corporation, The: *See—*
Reizman, Fremont; and McGraw, Robert B., Jr., 3,714,706.

Perkins, William E.; Schlack, Allen F.; and Ciccone, Thomas Q., to United States of America, Army. Compressible primer contact and fixed firing pin assembly. 3,714,728, Cl. 42-84.000.

Perkinson, Robert E., to McDonnell Douglas Corporation. Means for handling altitude information in collision avoidance systems. 3,715,717, Cl. 340-27.000.

Perlman, Barry Stuart, to RCA Corporation. Paired nonlinear active elements in a waveguide cavity adapted to support orthogonal TE_{10} mode waves and TE_{01} mode waves. 3,715,686, Cl. 331-96.000.

Perlowski, Edward F., Jr., to General Electric Company. Projection system. 3,715,494, Cl. 178-7.50d.

Perpedos AB: *See—*
Benson, Gustav Eric Valdemar, 3,715,060.

Perry, Adelbert W. Safety ladder brace. 3,715,012, Cl. 182-107.000.

Perry, Richard Anthony, to Odec Computer Systems, Inc. Impact hammer for liner printer. 3,714,892, Cl. 101-93.00c.

Persson, John A., to Pennsylvania Engineering Corporation. Electric smelting furnace electrode having a wooden core. 3,715,439, Cl. 13-18.000.

Peters, Franz, to Hergeth KG. Maschinenfabrik und Apparatebau. Regulator for feeding material to a processing machine. 3,715,041, Cl. 214-17.0ca.

Peters, Hans, to Henckels, J. A., Zwillingswerk, Firma. Method of manufacturing of knives. 3,714,850, Cl. 76-104.000.

Peterson, Francis C., to Hager, C., & Sons Hinge Manufacturing Company. Hinge mounted microswitch with adjustable actuator pin mounted on adjacent leaf. 3,715,537, Cl. 200-61.700.

Peterson, Robert A., to Raytheon Company. Twisted waveguide applicator. 3,715,551, Cl. 219-10.550.

Peterson, Stanley G., to Minnesota Mining and Manufacturing Company. Inking cover. 3,714,693, Cl. 29-132.000.

Petro-Tex Chemical Corporation: *See—*
Barone, Bruno J.; and Croce, Louis J., 3,715,391.
Croce, Louis J.; and Barone, Bruno J., 3,715,390.

Pettavel, Jacques: *See—*
Viret, Robert; and Pettavel, Jacques, 3,715,645.

Pfizer Inc.: *See—*
Miller, Max W., 3,715,356.

Phalin, Thomas Lawrence: *See—*
Kinkel, Christian Frederick; and Phalin, Thomas Lawrence, 3,715,052.

Phalin, Thomas Lawrence; and Birkholz, William Stephen, to American Can Company. Method and aparatus for supporting flexible container bodies in a closing machine. 3,714,755, Cl. 53-42.000.

Phillips Petroleum Company: *See—*
Gilbert, Dixie E., 3,715,109.
Horvath, Bertalan, 3,715,321.
Ray, Gardner C.; and Crain, Donald L., 3,715,410.
Venable, Charles R., Jr., 3,714,971.

Phillips, Stanley: *See—*
Whetstone, Albert; Fine, Samuel; and Phillips, Stanley, 3,714,689.

Photographic Silver Recovery Limited: *See—*
Bentley, James Sydney, 3,715,291.

Pianka, Max; and Edwards, John Duncan. Pesticidal esters of 2,6-dinitro-4-alkyl phenols. 3,715,384, Cl. 260-479.00r.

Piber, Earl T., to Cutler-Hammer Inc. Miniature multi-pole toggle switch with momentary action. 3,715,534, Cl. 200-67.00g.

Pickel, Hans: *See—*
Neitz, Alfred; and Pickel, Hans, 3,714,931.

Pierce, Ogden R.; and Kim, Yung Ki, to Dow Corning Corporation. Fluoroalkylene alcohols and esters. 3,715,387, Cl. 260-488.00h.

Pierce, Stanley L., Jr.; and Winn, William C., to Ford Motor Company. Automatic transmission controls for an automotive vehicle driveline. 3,714,836, Cl. 74-752.00c.

Pignataro, Tony, Jr., to Robinair Manufacturing Corporation. Permanent piercing access valve. 3,714,959, Cl. 137-318.000.

Pilc, Randolph John: *See—*
Gordon, Travis Hill; Marino, Patrick John; and Pilc, Randolph John, 3,715,505.

Pines, Seemon H.: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,715,382.

Pino, Piero: *See—*
Natta, Giulio; Pino, Piero; and Mazzanti, Giorgio, 3,715,344.

Pioneer Electronic Corporation: *See—*
Tsukagoshi, Tsunehiro, 3,715,522.

Piott, Chester J. Automatic telephone answering and recording system. 3,715,504, Cl. 179-6.0ac.

Pipino, Luciano: *See—*
Demonte, Filippo; and Pipino, Luciano, 3,715,724.

Pires, Antonio: *See—*
Daniels, John F.; and Pires, Antonio, 3,714,710.

Pirk, Hans; and Tillessen, Ulrich, to Nukem Nuklear-Chemie und-Metallurgie, GmbH. Apparatus for handling uranium hexafluoride at elevated pressure. 3,714,978, Cl. 165-1.000.

Pistor-Kette GmbH: *See—*
Muller, Anton, 3,714,975.

Plastic Rotational Moulding Limited: *See—*
Westbrook, Aubrey Joseph; and Thomson, Ian David Mac Knight, 3,715,179.

Plessey Company Limited, The: *See—*
Faulkner, Arthur M., 3,715,456.

Plessey Handel und Investments A.G.: *See—*
Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, 3,715,515.

Plooster, Myron N., to Union Carbide Corporation. Melt grown alumina crystals and process therefor. 3,715,194, Cl. 23-301.0sp.

Poff, James S.: *See—*
Yanof, Howard M.; Pansky, Ben; and Poff, James S., 3,714,943.

Pohlig-Heckel-Bleichert Vereinigte Maschinenfabriken Aktiengesellschaft: *See—*
Bruggemann, Hans; and Kulzer, Rudolf, 3,714,904.

Poirier, Raymond, to Societe Europeenne de Semiconducteurs et de Miroelectronique. Logic circuits employing complementary field-effect transistors in which the gate is insulated from the substrate. 3,715,637, Cl. 317-235.00r.

Polaroid Corporation: *See—*
Land, Edwin H.; Blinow, Igor; and Eloranta, Vaito K., 3,714,879.

Pollack, Shirley; and Finsilver, Devora. Hand shapable cap with adjustable headband. 3,714,670, Cl. 2-197.000.

Polus, Anthony P.; and Scheel, Russell H., to Advanced Digital Systems Inc. Data accessing system. 3,715,040, Cl. 214-16.40r.

Polye, William Ronald, to Bendix Corporation, The. Temperature compensator for capacitive pressure transducers. 3,715,638, Cl. 317-256.000.

Polymetallurgical Corporation: *See—*
Dion, Paul A.; and Hagarman, Paul O., 3,714,701.

Pond, George R.: *See—*
Rylander, Paul N.; Karpenko, Irene M.; and Pond, George R., 3,715,397.

Ponzoni, George Bernard: *See—*
Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.

Pope, Kenneth W., to Du Pont-of Canada Limited. Method of fabricating a building panel containing cellular polyurethane. 3,715,417, Cl. 264-45.000.

Posey, Alfred Henry; and Quick, Harry Clifford, Jr., to Sigma Instruments, Inc. Indicating meter with visual alarm. 3,715,661, Cl. 324-115.000.

Posselt, Klaus; and Thiele, Kurt. 2(3-Phenyl-3-hydroxypropyl 1-2 amino) ethyl-thienyl-(3)-ketone. 3,715,369, Cl. 260-332.30c.

Post Office, The: *See—*
Clarke, Eric Fifield Stuart; Cosier, James Edwin Henry; Kolanowski, Jan; Halls, Peter Seaton; and Laidlaw, Alexander Duncan Lindley, 3,715,068.

Potlatch Forests, Inc.: *See—*
Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., 3,715,257.

Potter, Ralph M.: *See—*

Jaffe, Mary S.; and Potter, Ralph M., 3,715,636.
Potz, Klaus: *See—*
Hennig, Fridolin; Kellner, Hans-Jurgen; Potz, Klaus; and Gotze, Christian, 3,715,261.
Powden, Alan Warren: *See—*
Bender, Frederick; Clermont, Louis-Philippe; and Powden, Alan Warren, 3,715,268.
Pradt, Louis A., to Sterling Drug Inc. Method of treatment of alkaline pulping black liquors by wet air oxidation. 3,714,911, Cl. 110-7.00r.
Praetzel, Hans Eberhard; Neukirchen, Ernst; and Jenkner, Herbert. Purification of tetrabromophthalic anhydride. 3,715,383, Cl. 260-475.0pr.
Prakla Gesellschaft fur Praktische Lagerstattenforschung GmbH: *See—*
Sender, Friedhelm K., 3,715,758.
Prather, Alfred G. B. Gravity escape means. 3,715,011, Cl. 182-100.000.
Prause, Dieter; and Sost, Rolf, to Bosch, Robert, Elektronik GmbH. Method and apparatus for electrically transmitting pictures. 3,715,475, Cl. 178-5.000.
Pregel, Ludwig: *See—*
Husch, Albert; Kemenes, Franz; and Pregel, Ludwig, 3,715,536.
Prentice, James S., to Esso Research and Engineering Company. Laminated non-woven sheet. 3,715,251, Cl. 156-62.800.
Preston, Edward George, to Molins Machine Company Limited. Handling apparatus for rod-like articles. 3,715,056, Cl. 221-211.000.
Price, James F.; and Shook, Kenneth, to Bethlehem Corporation, The. Mixing and humidification apparatus for breathing devices. 3,714,944, Cl. 128-209.000.
Price, James Kenneth: *See—*
Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, 3,715,515.
Pries, Erich E.; Errgang, Karl; and Drebes, Friedrich-Wilhelm, to Ott, C. Dr., & Comp. G.m.b.H. Coke car with fume-collecting hood. 3,715,282, Cl. 202-263.000.
Priest, Reginald Alfred Francis: *See—*
Irving, Alexander; and Priest, Reginald Alfred Francis, 3,715,721.
Prieur, Lucien Robert: *See—*
Rousseau, Hubert Cecyl Albert; and Prieur, Lucien Robert, 3,715,523.
Princeton Applied Research Corporation: *See—*
Reichard, Harry S., 3,715,678.
Pritz, Howard B.: *See—*
Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., 3,715,174.
Privott, Wilbur J., Jr.; and Cunningham, Robert E., to Monsanto Company. Low viscosity melt spinning process. 3,715,418, Cl. 264-82.000.
Privott, Wilbur J., Jr.; and Cunningham, Robert E., to Monsanto Company. Drag stabilized low viscosity melt spinning process. 3,715,419, Cl. 264-82.000.
Procter & Gamble Company, The: *See—*
Morgenstern, Arthur Stanley, 3,715,314.
Production, Inc.: *See—*
Schmidt, Gunter, 3,714,697.
Productron, Inc.: *See—*
Schmidt, Gunter, 3,715,087.
Propper Manufacturing Company, Inc.: *See—*
Hunsinger, Peter; and White, James C., 3,715,067.
Prost, Gerard: *See—*
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Protomastro, Michael Gabriel: *See—*
Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.
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Puhringer, Othmar, to Vereinigte Osterreichische Eisen- und Stahlwerk Aktiengesellschaft. Converter handling vehicle. 3,715,101, Cl. 254-87.000.
Pulliam, George R.: *See—*
O'Donnell, Cedric F.; and Pulliam, George R., 3,715,736.
Purcell, Ernest M.: *See—*
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Purdue Research Foundation: *See—*
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Putz, Ulrich, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for braking a vehicle. 3,715,602, Cl. 307-9.000.
Pye Limited: *See—*
Kipling, Barry John, 3,714,941.
Quaintance, Harold J., to Horizons Incorporated. Process and product of cold sealing an anodized aluminum article by a photo-polymerization process. 3,715,211, Cl. 96-35.100.
Quasius, Alan R.; and Shiman, Paul J., to Gillette Company, The. Hair spray unit containing a solution of a polymeric quaternary cellulose ether salt. 3,715,428, Cl. 424-47.000.
Quefellec, Andre: *See—*
Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, 3,715,703.
Quichaud, Claude; Le Peuvedic, Jean-Pierre; and Tinchon, Jacques, to Societe Nationale des Petroles d'Aquitaine. Device for suspending measuring instruments inside drilling assembly. 3,714,831, Cl. 73-431.000.
Quick, Harry Clifford, Jr.: *See—*
Posey, Alfred Henry; and Quick, Harry Clifford, Jr., 3,715,661.
Raab, Stefan, to Demag AG. Combined gripping and lifting mechanism for handling anode plates in an anode plate casting plant. 3,715,048, Cl. 214-16.00b.
Radcliffe, Milton R.: *See—*
Dornemann, Peter L.; Radcliffe, Milton R.; Newton, Albert E.; and Eaton, Samuel E., Jr., 3,715,260.
Radler, Frederick J.: *See—*
Young, Robert W.; and Radler, Frederick J., 3,715,690.
Raebiger, Wolfgang, to Grundig. Device for examining the piston rings in free-floating piston engines. 3,714,781, Cl. 60-54.50r.
Rainer, Norman B., to Seekay Chemical Co., Inc. Chelation polymer from nitrilo compound and ethylene imine compound. 3,715,339, Cl. 260-78.00a.
Raion Yushi Kabushiki Kaisha: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, 3,715,063.
Randow, Albert: *See—*
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Rapkin, Edward: *See—*
Thomas, Edward W.; and Rapkin, Edward, 3,715,586.
Rapshys, William, to Motorola, Inc. Integrated circuit frequency divider having low power consumption. 3,715,604, Cl. 307-220.000.
Ratliff, George D., Jr., to United States Steel Corporation. Reinforcing and supporting saddle for C-shaped sheet-metal beams. 3,714,752, Cl. 52-665.000.
Ravas, Richard J., to Westinghouse Electric Corporation. Staggered phase pulse width modulated inverter apparatus. 3,715,649, Cl. 321-45.00r.
Rawson, Donald E., to Gulf Oil Corporation. Method for excavating by explosions. 3,714,895, Cl. 102-23.000.
Rax Corporation: *See—*
Spencer, Calvin D., 3,715,100.
Ray, Gardner C.; and Crain, Donald L., to Phillips Petroleum Company. Conversion of cyclic olefins to acyclic polyenes. 3,715,410, Cl. 260-680.00r.
Raytheon Company: *See—*
Archer, Donald H., 3,715,749.
Mead, George S., 3,715,751.
Peterson, Robert A., 3,715,551.
Weber, Marvin J., 3,715,683.
RCA Corporation: *See—*
Allen, John Kenneth, 3,715,493.
Fitzgerald, William Vincent, Jr., 3,715,492.
Haynes, Harold E., 3,715,498.
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Liederbach, William Herman, 3,714,709.
Olson, Charles Langdon; Monahan, John Francis; and Dischert, Robert Adams, 3,715,477.
Perlman, Barry Stuart, 3,715,686.
Ross, Daniel Louis, 3,715,212.
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Sendelweck, Gene Karl, 3,715,464.
Steckler, Steven Alan, 3,715,499.
Weimer, Paul Kessler, 3,715,485.
Woodward, Oakley McDonald, 3,715,688.
Wright, Harry Gilbert; and Dischert, Robert Adams, 3,715,486.
RdF West: *See—*
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Read, Norman W., to Dresser Industries, Inc. Well tools and gripping members therefor. 3,714,984, Cl. 166-134.000.
Reddish, Wilson: *See—*
Hyde, Peter John; and Reddish, Wilson, 3,715,656.
Reed International Limited: *See—*
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Reed, Robert D.: *See—*
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Regoli, Domenico: *See—*
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Rehfeld, Frederick L. J.: *See—*
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Reichard, Harry S., to Princeton Applied Research Corporation. Active electrical filter. 3,715,678, Cl. 330-86.000.
Reiner, Roland: *See—*
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Feigel, Harold J.; Reizenstein, Harry S.; and Bloch, Gilbert, 3,714,757.
Reizman, Fremont; and McGraw, Robert B., Jr., to Perkin-Elmer Corporation, The. Array of conductors fixed through dielectric plate. 3,714,706, Cl. 29-624.000.
Reliance Electric Company: *See—*
Abnett, Albert C.; and Foster, George B., 3,715,659.
Relles, Howard M., to General Electric Company. Chlorination of ketonic acetyl groups. 3,715,407, Cl. 260-668.00r.
Rellinger, Oscar A. Truck retriever hoist. 3,715,042, Cl. 214-86.00a.

Relph, Warren L. Method and means of measuring the moisture content of grain. 3,714,818, Cl. 73-73.000.

Renn, Madeline S.: *See—*
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Renn, Neil R.; and Renn, Madeline S. Target and projecting apparatus including a balanced projectile. 3,715,121, Cl. 273-101.000.

Repsher, Dennis E.: *See—*
McGrath, John W.; and Repsher, Dennis E., 3,715,576.

Republic Corporation: *See—*
Richelmann, Bernd H., 3,715,662.

Research Corporation: *See—*
Mende, Thomas J., 3,715,434.

Reuss, Max L., Jr., to United States of America, Army. Microstrip-slot line phase shifter. 3,715,692, Cl. 333-24.100.

Rex Chainbelt Inc.: *See—*
Gley, Paul R., 3,714,684.

Rey-Bellet, Gerald; Schwartz, Daniel Ernest; and Reiner, Roland, to Hoffmann-La Roche Inc. N-oxides of benzylpyrimidnes. 3,715,357, Cl. 260-256.40n.

Reynolds, Elmer N. Water sprinkler device. 3,715,078, Cl. 239-206.000.

Reynolds Metals Company: *See—*
Vogeleer, George B., 3,714,758.

Reynolds, Robert L.: *See—*
Ernisse, Paul J.; and Reynolds, Robert L., 3,714,873.

Rhinehart, Robert R., Jr.: *See—*
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Rhone-Poulenc S.A.: *See—*
Boichard, Jacques; Brossard, Bernard Pierre; Gay, Michel Louis Marie Joseph; and Janin, Raymond Marc Clement, 3,715,394.

Ribaldone, Giuseppe; and Gafa, Salvatore, to Montecatini Edison S.p.A. Method of preparing sodium nitrilotriacetate. 3,715,393, Cl. 260-534.00e.

Richelmann, Bernd H., to Republic Corporation. Test contactor head for circuit modules. 3,715,662, Cl. 324-158.00f.

Ricoh Co. Ltd.: *See—*
Hiruma, Kenji; and Sugaya, Inawo, 3,715,564.
Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, 3,715,263.
Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, 3,715,267.

Rieser, Donald E., to International Harvester Company. Alternating mechanism for hydraulic markers. 3,714,991, Cl. 172-130.000.

Rigby, Frank; and Ainscough, John Brian, to United Kingdom Atomic Energy Authority. Nuclear fuel element containing sintered uranium dioxide fuel with a fine particulate dispersion of an oxide additive therein and method of making same. 3,715,273, Cl. 176-7.000.

Risgin, Ojars, to Sensors, Inc. Method of fabricating film type sensing structures. 3,715,288, Cl. 204-38.00a.

Risley, Robert F.: *See—*
Pagdin, William G.; and Risley, Robert F., 3,714,759.

Rissberger, Arthur C., Jr., to Eastman Kodak Company. Strip storage device. 3,715,088, Cl. 242-74.000.

Rittner, Siegbert: *See—*
Kuhne, Rudolf; Diery, Helmut; and Rittner, Siegbert, 3,715,319.

Ritz, Rudolf, to Gesellschaft fur Kernforschung m.b.H. Method of operating a nuclear reactor facility with a steam cooled fast breeder reactor as the heat source. 3,715,272, Cl. 176-60.000.

Rix, Albert; Werner, Georg; and Fuchs, Hans, to Olympia Werke AG. Apparatus for postponing and storing key controlled functions of a typewriter. 3,715,022, Cl. 197-98.000.

Roberts, Cecil P.; and Ochs, Charles S., to Anchor Hocking Corporation. High speed rotary container sealing machine with inclined sealing heads. 3,714,760, Cl. 53-112.00r.

Robertshaw Controls Company: *See—*
Martin, Stephen J., 3,715,502.

Robertson, John K.: *See—*
Audesse, Emery G.; Tartakoff, Alexander; and Robertson, John K., 3,715,232.

Robertson, W. H., Company: *See—*
Curran, Bernard Edwin, 3,714,747.

Robertson, William Lauchlin. Snow cleat and track for tracked vehicle. 3,715,146, Cl. 305-35.0eb.

Robiette, Alfred Gordon Evans, to Foseco International Limited. Electric arc stabilization in electric arc melting using carbon electrodes. 3,715,440, Cl. 13-18.000.

Robinair Manufacturing Corporation: *See—*
Pignataro, Tony, Jr., 3,714,959.

Robinson, E S & A Limited: *See—*
Gibbs, Gilbert Leslie; and Davies, Timothy Muir, 3,715,073.

Robinson, Gerald P. Reciprocating handstamp with magnetic plate holding means for removing the plate. 3,714,894, Cl. 101-382.0mv.

Robinson, Herbert N.: *See—*
De Grazio, Robert P.; and Robinson, Herbert N., 3,715,204.

Rodriguez, George: *See—*
Lewis, Tony E.; and Rodriguez, George, 3,714,809.

Rose, Frederick A., to Norland Corporation. Bone mineral analyzer. 3,715,588, Cl. 250-71.50s.

Rosenbaum, Edward W.; and Schoen, Kurt L., to Michael, David, & Co. Method of making free-flowing flavoring powders of high flavor-concentration and products thereof. 3,715,217, Cl. 99-140.00r.

Rosenberger, Chester A., Jr.; and Swartz, Horace M., to FMC Corporation. Takeup apparatus for truck tow conveyor system. 3,714,903, Cl. 104-196.000.

Rosenstingl, Emmanuel, to Intertechnique S.A. Method and apparatus for evaluating the degree of quenching in scintillation spectrometry. 3,715,584, Cl. 250-71.50r.

Ross, Daniel Louis, to RCA Corporation. Photochromic display and storage device and method of operation thereof. 3,715,212, Cl. 96-48.000.

Rostfria Tak AB: *See—*
Netterstedt, Sture; and Lindstrand, Bengt, 3,715,557.

Rothke, Ernst, to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung. Inflatable gripper for handling spools of textile machines. 3,714,770, Cl. 57-52.000.

Rousseau, Hubert Cecyl Albert; and Prieur, Lucien Robert, to Societe Industrielle Honeywell Bull (Societe Anonyme). Positioning mechanism for magnetic head. 3,715,523, Cl. 179-100.2ca.

Rowe International Inc.: *See—*
Okkonen, Oliver G., 3,715,031.

Rudes, Harry L. Garment with absorbent front and crotch pad pockets. 3,714,946, Cl. 128-295.000.

Ruehle, William H., to Mobil Oil Corporation. Apparatus for and method of treating seismic data to obtain a wide band representation. 3,715,715, Cl. 340-15.5dp.

Ruempelein, Fritz: *See—*
Kisselmann, Willy; Ruempelein, Fritz; and Kopf, Paul, 3,715,658.

Rug Crafters: *See—*
Montell, Joseph J.; and Houghton, George L., 3,714,915.

Ruhnke, Lothar H., to United States of America, National Aeronautics and Space Administration. Determining distance to lightning strokes from a singie station. 3,715,660, Cl. 324-72.00r.

Ruiter, Larry D.: *See—*
Zoerner, Richard L.; and Ruiter, Larry D., 3,714,994.

Rumanowski, Edmund J., to Allied Chemical Corporation. Alkyl-N-alkyl-chlorophenoxythioacetimidates. 3,715,380, Cl. 260-453.00r.

Rushton, William E.; Seavoy, Gordon E.; and Morey, Woodruff A., to Whiting Corporation. Apparatus for making wet process phosphoric acid. 3,715,191, Cl. 23-260.000.

Russell, Roger Howard, to McIntosh Laboratory,Inc. Loudspeaker system. 3,715,501, Cl. 179-1.00d.

Ruyle, William V.: *See—*
Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., 3,715,375.

Ryan, Edmond J. Purified oxygen gas containing ozone and higher oxygen polymers. 3,715,430, Cl. 424-127.000.

Rylander, Paul N.; Karpenko, Irene M.; and Pond, George R., to Engelhard Minerals & Chemicals Corporation. Process for preparing paraaminophenol. 3,715,397, Cl. 260-575.000.

Saab Aktiebolag: *See—*
Angelstrand, Borje; and Mostrom, Ragnar, 3,715,086.

Sabatino, Daniel D.: *See—*
Wilkens, Henry W.; and Sabatino, Daniel D., 3,714,823.

Sadler, Thomas Harry, to Johns-Manville Corporation. Dual treatment of asbestos fibers. 3,715,230, Cl. 117-70.00s.

Sado, Ryoichi, to Shinetsu Chemical Company. Silicone stopper for a sterile container. 3,715,047, Cl. 215-47.000.

Saito, Shizuko: *See—*
Nogami, Sumitaka; Saito, Shizuko; and Okada, Tooru, 3,715,330.

Saitou, Norio: *See—*
Maekawa, Akiji; Munakata, Chusuke; and Saitou, Norio, 3,715,580.

Sajar Plastics, Inc.: *See—*
Johnson, Tom W.; and Johnson, Joe L., 3,714,958.

Sakai, Kiyoshi: *See—*
Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, 3,715,263.
Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, 3,715,267.

Salvade, Gennaro, to Bobst, J., & Fils, S.A. Leveling device for sheet material feeding mechanism. 3,715,116, Cl. 271-44.00a.

Salzano, Francis J.; Hobdell, Michael R.; Minushkin, Bertram; Kalinowski, Walter; and Newman, Leonard, to United States of America, Atomic Energy Commission. Electrochemical carbon activity meter. 3,715,296, Cl. 204-195.00r.

Sampson, Robert W., to Universal Oil Products Company. Transducer for converting selected environmental parameter differentials to frequency differentials. 3,715,657, Cl. 324-140.00r.

Sandberg, Curt Ove Bille, to Telefonaktiebolaget L M Ericsson. Tripping arrangement for ringing current signals in telephone exchanges. 3,715,517, Cl. 179-18.0hb.

Sandberg, Gary K., to Omark Industries, Inc. Energy absorbing structures. 3,715,137, Cl. 293-1.000.

Sander-Wander, Inc.: *See—*
Houlihan, William J., 3,715,366.

Sanderson, Leon Franklin: *See—*
Hubbard, Arthur Lowell; and Sanderson, Leon Franklin, 3,714,767.

Sandkvist, Hugo: *See—*
Grune, Per-Olof; Pucher, Walter; and Sandkvist, Hugo, 3,715,542.

Sandner, Michael Ray; and Osborn, Claiborn Lee, to Union Carbide Corporation. Acetophenone-type photosensitizers for radiation curable coatings. 3,715,293, Cl. 204-159.140.

Sansone, Eugene A.: *See—*
Amato, Jack C.; and Sansone, Eugene A., 3,714,972.

Saray, George B., to Ivanhoe Research Corporation. Thread monitoring device. 3,714,916, Cl. 112-218.00r.

Sasmor, Ernest J.: *See—*
Halpern, Alfred; and Sasmor, Ernest J., 3,715,437.

Sato, Keiichi: *See*—
Kobayashi, Akira; Koike, Toshio; and Sato, Keiichi, 3,715,085.

Sato, Masamichi, to Fuji Photo Film Co., Ltd. Corona charging process and apparatus in electrophotography. 3,715,640, Cl. 317-262.00a.

Sato, Takashi: *See*—
Kubo, Keishi; Sakai, Kiyoshi; Sato, Takashi; and Nakamura, Itaru, 3,715,263.
Kubo, Keishi; Sakai, Kiyoshi; and Sato, Takashi, 3,715,267.

Satoh, Kimio: *See*—
Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, 3,715,431.

Sauer, Roland; Katzer, Johannes; and Stephany, Christian, to Messrs., Jupex AG. Pipeline systems. 3,714,962, Cl. 137-371.000.

Saumsiegle, Robert W.: *See*—
MacInnes, John M.; and Saumsiegle, Robert W., 3,714,756.

Sauter, William D., to Schlumberger Technology Corporation. Well logging methods and apparatus for converting spatial derivatives measurements to time derivative measurements. 3,715,653, Cl. 324-1.000.

Savage, Joseph W.; and Brands, Henry J., to General Electric Company. Cooled turbine blade. 3,715,170, Cl. 416-97.000.

Sayles, David C., to United States of America, Army. Propellants derived from crosslinking of polybutadiene elastomers. 3,715,246, Cl. 149-19.000.

Scarzello, John F., to United States of America, Navy. Crystal magnetometer and gradiometer. 3,715,654, Cl. 324-.50r.

Schadow, Rudolf H. Push button switch position indicator. 3,715,548, Cl. 200-167.00r.

Schafer, Richard Arthur, to Deere & Company. Attachments permitting a vehicle tongue to be lifted by actuation of tractor draft links. 3,715,133, Cl. 280-479.00a.

Schauer, George A.: *See*—
Louis, Joseph E.; and Schauer, George A., 3,714,846.

Scheel, Russell H.: *See*—
Polus, Anthony P.; and Scheel, Russell H., 3,715,040.

Schiess, George, to RCA Corporation. Transistor deflection circuits utilizing a class B, push-pull output stage. 3,715,621, Cl. 315-27.0td.

Schild, A., S.A.: *See*—
Zaugg, Roland; Glanzmann, Werner; and Fluck, Josef, 3,714,774.

Schildkraut, Sid I.: *See*—
Bernstein, Julius; Schildkraut, Sid I.; and Muller, John P., 3,715,710.

Schiller, Peter: *See*—
Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, 3,714,814.

Schiltz, Jos., Brewing Company: *See*—
Pagdin, William G.; and Risley, Robert F., 3,714,759.

Schlack, Allen F.: *See*—
Perkins, William E.; Schlack, Allen F.; and Ciccone, Thomas Q., 3,714,728.

Schlatter, Rene, to Latrobe Steel Company. Apparatus for electroslag melting. 3,715,201, Cl. 75-10.000.

Schlinger, Warren G.: *See*—
Tassoney, Joseph P.; and Schlinger, Warren G., 3,715,195.
Tassoney, Joseph P.; and Schlinger, Warren G., 3,715,301.

Schlumberger Technology Corporation: *See*—
Sauter, William D., 3,715,653.
Wilson, Gerald E., 3,714,983.

Schmelzer, Hans-Georg; Gruber, Hermann; Degener, Eberthart; and Wagner, Kuno, to Farbenfabriken Bayer Aktiengesellschaft. Sealing compositions from polyketimines or polyenamines. 3,715,338, Cl. 260-77.5am.

Schmid, Hans; Feldhoff, Heinrich; Martin, Wolfgang; Bauer, Wolfgang; and Herion, Dieter, to Badische Anilin- & Soda Fabrik Aktiengesellschaft. Process and apparatus for texturing filaments. 3,714,686, Cl. 28-1.400.

Schmid, Jakob. Door closing mechanism with fluid brake. 3,714,677, Cl. 16-62.000.

Schmidt, Gunter, to Production, Inc. Film chip stripper. 3,714,697, Cl. 29-239.000.

Schmidt, Gunter, to Productron, Inc. Sheet film storage magazine. 3,715,087, Cl. 242-67.30r.

Schmidt, James H.: *See*—
Smith, Cloyd D.; and Schmidt, James H., 3,715,009.

Schmit, Francis M., to Honeywell Inc. Optical mass memory. 3,715,740, Cl. 340-174.10m.

Schmitt, Dieter: *See*—
Wenz, Adolf; Stein, Alfred; and Schmitt, Dieter, 3,715,192.

Schneiders, Albert M.; Schiller, Peter; Hollebeck, Gustave L.; and Diletti, Friedhelm, to European Atomic Energy Community (Euratom). Tight viscosimeter working in aggressive media. 3,714,814, Cl. 73-54.000.

Schoeffler, William N. Self-cleaning storm choke. 3,714,957, Cl. 137-244.000.

Schoen, Karl; and Pachter, Irwin J., to Endo Laboratories, Inc. Oxoisoindoles. 3,715,354, Cl. 260-247.50b.

Schoen, Kurt L.: *See*—
Rosenbaum, Edward W.; and Schoen, Kurt L., 3,715,217.

Schon, Erwin: *See*—
Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.

Schranz, Karl-Wilhelm: *See*—
Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.

Schranz, Karl-Wilhelm; Hunicke, Wolfgang; and Busch, Josef, to Agfa-Gevaert Aktiengesellschaft. Apparatus for developing exposed light-sensitiv sheets. 3,714,882, Cl. 95-89.00r.

Schroder, Rolf, to Agfa-Gevaert Aktiengesellschaft. Photographic still camera. 3,714,877, Cl. 95-31.0fm.

Schroeter, Siegfried H., to General Electric Company. Process for producing 3-hydroxyalkyl ethers. 3,715,401, Cl. 260-611.00r.

Schuh, Theodore R.: *See*—
Dembowski, Ronald J.; and Schuh, Theodore R., 3,715,172.

Schultz, Seiford F.; and Nix, Andrew B., to United States of America, Army. Method for production of composite and modified double base reinforced carpet roll grain. 3,715,414, Cl. 264-3.00r.

Schulze, Heinz, to Jefferson Chemical Company, Inc. Imidazole synthesis. 3,715,365, Cl. 260-309.000.

Schumer, Louis. Wig and wiglet carrying case. 3,715,028, Cl. 206-8.000.

Schunck, Gunter; Speeter, Winfried; and Randow, Albert, to Siemens Aktiengesellschaft. Single-wing light chopper for infrared gas analyzers. 3,715,153, Cl. 350-273.000.

Schwappach, Dieter: *See*—
Kollmann, Wolfgang; and Schwappach, Dieter, 3,715,039.

Schwartz, Daniel Ernest: *See*—
Rey-Bellet, Gerald; Schwartz, Daniel Ernest; and Reiner, Roland, 3,715,357.

Schwarz, Gunter. Device for catching a runaway ski. 3,715,126, Cl. 280-11.13b.

Schweitzer, E. O., Manufacturing Co., Inc.: *See*—
Schweitzer, Edmund O., Jr., 3,715,742.

Schweitzer, Edmund O., Jr., to Schweitzer, E. O., Manufacturing Co., Inc. Alternating current fault indicating means. 3,715,742, Cl. 340-253.00a.

Science Accessories Corporation: *See*—
Whetstone, Albert; Fine, Samuel; and Phillips, Stanley, 3,714,689.

Scoggins, Cecil W.: *See*—
Todd, Donald L.; and Scoggins, Cecil W., 3,715,062.

Searle, G. D. & Co.: *See*—
Sollman, Paul B., 3,715,349.

Searle Medidator Inc.: *See*—
Worthington, Harvey R., Jr., 3,715,157.

Sears, Bobby Joe; and Brown, Wade E., to FMC Corporation. Brush back roller. 3,714,948, Cl. 130-5.00r.

Seaton, William Joe, to Emdeko International, Inc. Vehicle pendulum alarm switch. 3,715,533, Cl. 200-61.520.

Seats, Peter: *See*—
Paley, Alfred I.; Newman, Leonard; Seats, Peter; and Waxenbaum, Bernard M., 3,715,618.

Seavoy, Gordon E.: *See*—
Rushton, William E.; Seavoy, Gordon E.; and Morey, Woodruff A., 3,715,191.

Sedriter Corporation: *See*—
Drekter, Isaac J.; Bradley, Frank R.; Matthew, Morton P.; and Delaney, Paul, 3,715,761.

Seekay Chemical Co., Inc.: *See*—
Rainer, Norman B., 3,715,339.

Seiden, Steven Arnold. Infant head support. 3,715,140, Cl. 294-25.000.

Sekisui Kagoku Kogyo Kabushiki Kaisha: *See*—
Kiyono, Hiroshi; Nakashima, Unichi; Fujisaki, Yasuyuki; Ishigaki, Yukio; and Endo, Gen, 3,715,420.

Sekizawa, Yasuharu: *See*—
Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, 3,715,431.

Selke, Lynn A.: *See*—
Kostusiak, Karl H.; and Selke, Lynn A., 3,715,090.

Selman, Howard L.: *See*—
Miska, Aivars; and Selman, Howard L., 3,714,950.

Sendelweck, Gene Karl, to RCA Corporation. High voltage hold-down circuit. 3,715,464, Cl. 178-5.40r.

Sender, Friedhelm K., to Prakla Gesellschaft fur Praktische Lagerstattenforschung GmbH. Methods and apparatus for precise positioning of locations. 3,715,758, Cl. 343-112.00r.

Sensors, Inc.: *See*—
Risgin, Ojars, 3,715,288.

Service, Anthony Peter: *See*—
Watkinson, Leonard J.; and Service, Anthony Peter, 3,715,210.

Sessler, Gerhard Martin; and West, James Edward, to Bell Telephone Laboratories Incorporated. Unidirectional microphones. 3,715,500, Cl. 179-1.0dm.

Setterblade, Earl O., to Avco Corporation. Marine propulsion unit. 3,714,920, Cl. 115-18.00r.

Seymour, Shaun A.: *See*—
Halls, Lawrence M.; and Seymour, Shaun A., 3,715,002.

SFB Spezial-Filterbau M. Ofner K.G.: *See*—
Ofner, Max, 3,714,926.

Shaffer, William E., to Stromberg-Carlson Corporation. Telephone pulsing circuit. 3,715,511, Cl. 179-16.00e.

Shaheen, Joseph M.; and Simone, John, to North American Rockwell Corporation. Method of making interstitial conductors between plated memory wires. 3,714,707, Cl. 29-604.000.

Sharp, Marcus: *See*—
Altman, Leonard F.; and Sharp, Marcus, 3,715,250.

Shaw & Slavsky, Inc.: *See*—
Slavsky, Robert J., 3,714,724.

Shawcroft, John B. Apparatus for handling baled hay. 3,715,045, Cl. 214-655.000.

Sheldahl, David B.: *See—*
Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., 3,715,312.

Shell Oil Company: *See—*
Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, 3,714,811.
Drinkwater, John W.; and Evans, Albert, 3,714,812.

Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce. Automatic ice dispenser. 3,715,119, Cl. 222-241.000.

Shelley, Robert J., Jr.: *See—*
Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce, 3,715,119.

Shellhause, Ronald L., to General Motors Corporation. Vehicle brake control module and mounting means. 3,714,780, Cl. 60-54.60r.

Shen, Tsung-Ying: *See—*
Witzel, Bruce E.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, 3,715,358.

Shen, Tsung-Ying; Ruyle, William V.; Fordice, Michael W.; and Jensen, Norman P., to Merck & Co., Inc. Diphenyl sulfones. 3,715,375, Cl. 260-397.600.

Shendure, Ashok S., to Crawford Fitting Company. Valved quick-disconnect coupling. 3,715,099, Cl. 251-149.100.

Sherr, Allan Ellis, to American Cyanamid Company. Aminium and diimonium salts used as polymerization inhibitors of acrylates and carbonates. 3,715,386, Cl. 260-486.00r.

Sherwood Medical Industries Inc.: *See—*
Weichselbaum, Theodore E.; and Wilhelmson, Jack L., 3,715,570.

Shiba Electric Co., Ltd.: *See—*
Karato, Yoshiteru, 3,715,466.

Shibata, Akira, to Chugai Denkikogyo Kabushiki Kaisha. Cold welding machine. 3,715,070, Cl. 228-44.000.

Shiman, Paul J.: *See—*
Quasius, Alan R.; and Shiman, Paul J., 3,715,428.

Shinetsu Chemical Company: *See—*
Sado, Ryoichi, 3,715,047.

Shionogi & Co., Ltd.: *See—*
Hamashima, Yoshio, 3,715,350.

Shionoya, Gosaburo: *See—*
Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, 3,715,279.

Shook, Kenneth: *See—*
Price, James F.; and Shook, Kenneth, 3,714,944.

Shoults, Royland D., to United States of America, Army, mesne. 2,2,4,4-Tetrakis (difluoroamino) pentane process. 3,715,399, Cl. 260-583.0nh.

Shriver, Charles S., to Orbit Manufacturing Company. Clean-operating baseboard heater. 3,714,982, Cl. 165-55.000.

Shroff, James R.: *See—*
Bandurco, Victor; Elpern, Bill; and Shroff, James R., 3,715,396.

Shuler, Bernard R.: *See—*
Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.

Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, to Montecatini Edison S.p.A. Fluorinated peroxy polyether copolymers and method for preparing them from tetrafluoroethylene. 3,715,378, Cl. 260-463.000.

Siciliano, George R., to General Electric Company. Preparation of organosilicone esters. 3,715,377, Cl. 260-448.20e.

Siemens Aktiengesellschaft: *See—*
Schunck, Gunter; Speeter, Winfried; and Randow, Albert, 3,715,153.

Sigma Instruments, Inc.: *See—*
Posey, Alfred Henry; and Quick, Harry Clifford, Jr., 3,715,661.

Silberg, Paul A.; and Lewis, John R., to Harnessed Energies, Inc. Fluid level monitoring system. 3,715,539, Cl. 200-84.00c.

Simoncioni, Otello M. Roller paint applicator. 3,714,674, Cl. 15-230.110.

Simone, John: *See—*
Shaheen, Joseph M.; and Simone, John, 3,714,707.

Simonelli, Carl L., to Central Vac International, Inc. Wall-mounted vacuum cleaner. 3,714,765, Cl. 55-472.000.

Simons, Gary A. Roof mounted carrier for automotive vehicles. 3,715,044, Cl. 214-450.000.

Simplex Time Recorder Company: *See—*
Denton, Howard P., 3,715,743.

Sims, Willard M.: *See—*
Finestone, Arnold B.; and Sims, Willard M., 3,715,340.

Sindall, John Henry, to Imperial Metal Industries (Kynoch) Limited. Gas pressure actuators. 3,714,863, Cl. 89-1.000.

Singer Company, The: *See—*
Amato, Jack C.; and Sansone, Eugene A., 3,714,972.
Weisz, William; and Herron, William L., 3,714,678.

Singer Company, The, mesne: *See—*
Walter, Heinz E., 3,715,642.

Singleback, George W.: *See—*
Brush, R. John H.; and Singleback, George W., 3,715,479.

SKB Arms Company: *See—*
Iino, Hideo, 3,714,727.

Slagel, Robert C.; and Culbertson, Billy M., to Ashland Oil, Inc. Polymers of vinyl aminimides. 3,715,343, Cl. 260-88.1pn.

Slavsky, Robert J., to Shaw & Slavsky, Inc. Display marker clip. 3,714,724, Cl. 40-11.000.

Sletzinger, Meyer: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,715,382.

Sliwkowski, Joseph J.: *See—*
Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., 3,715,166.

Sloan, Donald A., to Bahnson Company, The. Automatic control system for traveling cleaners. 3,714,676, Cl. 15-312.00r.

Sloan Valve Company: *See—*
Billeter, Henry R., 3,714,968.

Smith, A. O., Corporation: *See—*
Wasson, Loerwood C., 3,715,566.

Smith, Bart A.: *See—*
Venier, Dominic A.; Smith, Bart A.; and Lass, James L., 3,715,274.

Smith, Cloyd D.; and Schmidt, James H., to General Acoustics Corporation. Jet engine noise suppression system. 3,715,009, Cl. 181-33.0hc.

Smith, Francis Hughes, to Vickers Limited. Investigating the topgraphy of reflecting surfaces. 3,715,165, Cl. 356-120.000.

Smith, James G., to Borg-Warner Corporation. Automotive transmission. 3,714,849, Cl. 74-869.000.

Smith, Lowell E.: *See—*
Hurley, Eldon K.; Maule, Robert S.; Musso, Rocco C.; and Smith, Lowell E., 3,715,131.

Smith, Milton R., to Lilly, Eli, and Company. Glucagon separation process. 3,715,345, Cl. 260-112.500.

Smith, Roy: *See—*
Lyth, William; and Smith, Roy, 3,715,013.

Smith, Stanley L.; Choate, William C.; and Masten, Michael K., to Texas Instruments, Incorporated. Multi-criteria search procedure for trainable processors. 3,715,730, Cl. 340-172.500.

Sobek, Felix. Shaft lime kiln. 3,715,111, Cl. 432-4.000.

Societe Anonyme Automobiles: *See—*
Grosseau, Albert, 3,714,841.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Wuhrmann, Jean-Jacques; and Cristofaro, Elvira, 3,715,216.

Societe de la Viscose Suisse: *See—*
Martin, Horst G.; Glutz, Bernhard; and Linz, Hans, 3,715,421.

Societe Europeenne de Semiconducteurs et de Miroelectronique: *See—*
Poirier, Raymond, 3,715,637.

Societe Genevoise d'Instruments de Physique: *See—*
Viret, Robert; and Pettavel, Jacques, 3,715,645.

Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
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Societe Industrielle Honeywell Bull (Societe Anonyme): *See—*
Rousseau, Hubert Cecyl Albert; and Prieur, Lucien Robert, 3,715,523.

Societe Nationale des Petroles d'Aquitaine: *See—*
Lutz, Jean, 3,714,822.
Quichaud, Claude; Le Peuvedic, Jean-Pierre; and Tinchon, Jacques, 3,714,831.

Soldano, Benadetto A., to United States of America, Atomic Energy Commission. Reactor safety spray solution base-borate. 3,715,316, Cl. 252-188.000.

Sole, Jean: *See—*
Croso, Hubert; Prost, Gerard; Quefellec, Andre; and Sole, Jean, 3,715,703.

Solender, Peter E., to GTE Sylvania Incorporated. Non-linear voltage generating apparatus. 3,715,687, Cl. 331-179.000.

Solis S.r.L.: *See—*
Mazzi, Aramis, 3,714,800.

Sollman, Paul B., to Searle, G. D. & Co. 17-Hydroxy-7 (-Hydroxy-7 alpha-mercapto-3-oxo-17alpha-pregn-4- ene-21-carboxylic acid gamma-lactone. 3,715,349, Cl. 260-239.570.

Solvang, Paul O., to National Water-Blast Inc. Pressure relief valve. 3,714,953, Cl. 137-14.000.

Someya, Akira; and Kohmoto, Kohtaro, to Tokyo Shibaura Electric Co., Ltd. Low pressure mercury vapour discharge lamp radiating germicidal and erythemal rays in ratio of less than 1.5. 3,715,612, Cl. 313-109.000.

Sonnabend, Nancy L. Children's game apparatus. 3,714,722, Cl. 35-8.000.

Sony Corporation: *See—*
Ito, Takamasa; and Makino, Tsutomu, 3,715,744.
Okada, Takashi, 3,715,490.
Takise, Tadashi; and Okada, Takashi, 3,715,488.
Tamaru, Hideshi; and Ishigaki, Yoshio, 3,715,469.
Tsuchiya, Noriyuki; Amari, Katsutoshi; Moriya, Takao; and Takahashi, Shideko, 3,715,285.

Soriente, Alfonse J., to Ecodyne Corporation. Filter cartridge. 3,715,033, Cl. 210-193.000.

Sost, Rolf: *See—*
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Spaulding, David Adams: *See—*
Hirsch, Donald; and Spaulding, David Adams, 3,715,670.
Mueller, Kurt Hugo; and Spaulding, David Adams, 3,715,666.

Spaunburgh, Richard G.; and Hino, John B., to Allied Chemical Corporation. Polyisocyanate compositions stabilized against discoloration. 3,715,381, Cl. 260-453.00p.

Special Devices, Inc.: *See—*
Filippi, Ernest A., 3,714,899.

Spectral Data Corporation: *See—*
Yost, Edward F., Jr., 3,714,875.

Speeter, Winfried: *See*—
Schunck, Gunter; Speeter, Winfried; and Randow, Albert, 3,715,153.
Speicher, Charles A.: *See*—
Magill, Peter J.; McCurry, Robert E.; and Speicher, Charles A., 3,715,762.
Spencer, Calvin D., to Rax Corporation. Support rack for camper bodies. 3,715,100, Cl. 254-49.000.
Sperry Rand Corporation: *See*—
Bohman, Carl E., 3,715,577.
Braddon, Frederick D., 3,715,571.
Daniels, John F.; and Pires, Antonio, 3,714,710.
Daniels, John F., 3,714,711.
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Elfe, Thomas B., Jr., 3,715,616.
Grundy, Gary L., 3,715,737.
Halls, Lawrence M.; and Seymour, Shaun A., 3,715,002.
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Nicolson, Alexander M., 3,715,667.
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Spohr, Rolf: *See*—
Hunicke, Wolfgang; Spohr, Rolf; Schranz, Karl-Wilhelm; Busch, Josef; Schon, Erwin; and Frick, Hans-Dieter, 3,714,883.
Spotts, J. Willard, to McGraw-Edison Company. Camp stove. 3,714,938, Cl. 126-38.000.
Sprecher & Schuh AG: *See*—
Morva, Tibor, 3,715,532.
Spry, Douglas O.; and Wright, Ian G., to Lilly, Eli, and Company. Process for acetylation. 3,715,347, Cl. 260-239.100.
Spurway's Industries Pty. Limited: *See*—
Boyd, Clive Reginald, 3,714,810.
Spuv, Valentin Georgievich: *See*—
Travin, Lev Viktorovich; and Spuv, Valentin Georgievich, 3,715,606.
Squibb, E. R., & Sons, Inc.: *See*—
Krapcho, John, 3,715,353.
S.S.S. Patents Limited: *See*—
Heybourne, Robert Howard; and Clements, Herbert Arthur, 3,715,019.
Standard Car Truck Company: *See*—
Barber, Franklin D., 3,714,905.
Standard Oil Company: *See*—
Brannen, William T., 3,715,311.
Wennerberg, Arnold N.; and Frazier, Alvin W., 3,715,303.
Standard Oil Company (Indiana): *See*—
Harrier, Jack L., 3,715,233.
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Stanley Electric Co., Ltd.: *See*—
Aizawa, Masanobu; and Mori, Kijuu, 3,714,691.
Stanley, Vayden F., to Vicra Sterile, Inc. Digit manipulable quick release cannula insertion device. 3,714,945, Cl. 128-214.400.
Stapfer, Christian H.; and D'Andrea, Richard W., to Carlisle Chemical Works, Inc. Cobalt II halide hydrazine complexes. 3,715,328, Cl. 260-22.0ca.
Stapleford, Gary N.: *See*—
Wallin, Gary P.; and Stapleford, Gary N., 3,715,726.
Star Sprinkler Corporation: *See*—
Gloeckler, Fred A., 3,714,989.
Star Sprinkler Corporation of Florida: *See*—
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Stauffer Chemical Company: *See*—
Cope, Richard P., Jr., 3,715,289.
Steckler, Steven Alan, to RCA Corporation. Dual mode automatic frequency controlled oscillator system. 3,715,499, Cl. 178-69.5rv.
Stefanucci, Arthur: *See*—
Balling, Theodore Thomas; Leonard, Richard J.; Ponzoni, George Bernard; Protomastro, Michael Gabriel; and Stefanucci, Arthur, 3,715,215.
Stein, Alfred: *See*—
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Stein, Alfred H.: *See*—
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Stein, Wolfgang J.; Ainsworth, Richard; and Berkner, Horst D., to Avco Corporation. Gas turbine engine having a horizontal accessory gear box. 3,714,779, Cl. 60-39.310.
Steinhardt, Frank J. Gear desurring device. 3,714,740, Cl. 51-33.000.
Stempel, Arthur; and Westley, John, to Hoffmann-La Roche, Inc. Derivatives of antibiotic X-537A. 3,715,372, Cl. 260-345.800.
Stephany, Christian: *See*—
Sauer, Roland; Katzer, Johannes; and Stephany, Christian, 3,714,962.
Sterling Drug Inc.: *See*—
Pradt, Louis A., 3,714,911.
Stern, Lionel: *See*—
Henshaw, David Ernest; Knothe, Werner Emil Otto; and Stern, Lionel, 3,714,771.
Stevens, Clifford A., to Texaco Inc. Cleaning aluminum heat exchange surfaces. 3,714,979, Cl. 165-1.000.
Stevens, Howard A., 1/2 to Stevens, Stanley H. Spin off wheel for crocheting. 3,715,089, Cl. 242-129.500.
Stevens, J. P., & Co., Inc.: *See*—
Yarber, Harold Dean, 3,714,685.
Stevens, Stanley H.: *See*—
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Stewart, Edwin E.: *See*—
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Stewart, John Kenneth, to Canron, Inc. Tie tamper. 3,714,901, Cl. 104-12.000.
Stewart-Warner Corporation: *See*—
Zupan, Frank M.; and Zurek, Jerome N., 3,714,967.
Sticker, Robert E.: *See*—
Harnish, Wayne N.; Sticker, Robert E.; and Carls, Glen A., 3,715,435.
Stiegemeier, Jean R. Progressive display screen. 3,715,716, Cl. 340-23.000.
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Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, to Plessey Handel und Investments A.G. Shift-register re-entry scanner with confirmation scan for detected disparity. 3,715,515, Cl. 179-18.0ff.
Stone, Morris Denor, to Wean United, Inc. Control system and method for concurrent automatic gage and crown control of a rolling mill. 3,714,805, Cl. 72-8.000.
Stork, Edward S.: *See*—
Jackson, Dean B.; Stork, Edward S.; and Flory, Darrell L., 3,715,023.
Stott, Ronald A., to General Electric Company. Non-rectifying composite contact for semiconductor devices. 3,715,234, Cl. 117-217.000.
Strangfeld, Reiner, to August Herzog Maschinenfabrik. Apparatus for reversing the bobbins in a braiding machine. 3,714,861, Cl. 87-51.000.
Strelzoff, Samuel. Catalyst support. 3,715,193, Cl. 23-288.00r.
Strickler, Melvin D.; and Pellerin, Roy F., to Washington State University Research Foundation. Combined tensile E measurement and proof loading of lumber. 3,714,820, Cl. 73-89.000.
Stromberg-Carlson Corporation: *See*—
Jungbluth, Ernest J.; Kavanaugh, Paul K.; and Gardner, Frederick H., 3,715,503.
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Sub-Marine Systems, Incorporated: *See*—
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Moebes, Erich; and Hitzel, Hans, 3,715,235.
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Nakabe, Ryuhei; Fujisawa, Seiji; Sugihara, Yasuhiro; and Meki, Nori, 3,715,471.
Sugiyama, Uichiro. Tire pressure indication system. 3,715,719, Cl. 340-58.000.
Sukup, Eugene G. Control system for grain drying bin. 3,714,718, Cl. 34-56.000.
Sulfaro, Andrew N.; and Stein, Alfred H., to Oxy Metal Finishing Corporation. Apparatus and process for treating toxic waste materials. 3,715,308, Cl. 210-60.000.
Sullivan, Bernard J.: *See*—
Leighty, Clifford A.; Sliwkowski, Joseph J.; and Sullivan, Bernard J., 3,715,166.
Sullivan, Hugh R.; and Billings, Ruth E., to Lilly, Eli, and Company. Hydroxylated acronycine. 3,715,359, Cl. 260-279.00r.
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Sun Oil Company: *See*—
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Supernaw, Dwight L., to United States of America, Navy. Apparatus for steering a torpedo. 3,714,917, Cl. 114-20.000.
Susquehanna Corporation, The: *See*—
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Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Miyamoto, Shinzo, to Raion Yushi Kabushiki Kaisha. Cap structure holding an inner closure. 3,715,063, Cl. 222-545.000.

Suter, Henry, to United States of America, Navy. Sonic detection apparatus. 3,715,672, Cl. 328-150.000.
Suzuki, Hiroyuki; Shionoya, Gosaburo; Suzuki, Yoshihisa; and Hirahara, Tsuneo, to Ajinomoto Co., Inc. Recovery of protease values from fermentation broths. 3,715,279, Cl. 195-68.000.
Suzuki, Kenichiro. Dehumidifying device for an air brake. 3,714,763, Cl. 55-163.000.
Suzuki, Takatoshi: *See—*
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Suzuki, Yoshihisa: *See—*
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Swartz, George A. Simulated ball game apparatus. 3,715,124, Cl. 273-93.00r.
Swartz, Horace M.: *See—*
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Swengel, Robert Charles, Sr., to AMP Incorporated. Wiring device for interconnecting module circuit units. 3,715,629, Cl. 317-101.00r.
Swingline Inc.: *See—*
Stuertz, William D.; and Martorano, Sam, 3,714,857.
Swotinsky, Jacob M.; Newman, Stephen; and Colitti, Olindo A., to United States of America, Army. Castable metallic illuminant fuel containing nitrocellulose plasticized binder. 3,715,248, Cl. 149-39.000.
Szabo, John, to Electrohome Limited. Network for varying current through a load. 3,715,623, Cl. 315-194.000.
Szupillo, Raymond E., to Corning Glass Works. Chromium film microcircuit mask. 3,715,244, Cl. 148-31.500.
Tait, William C.: *See—*
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Takada, Yoshinori: *See—*
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Takasaki, Yoshiyuki; and Kamibayashi, Akira, to Industrial Science & Technology, Agency of. Enzymatic method for manufacture of fructose from glucose. 3,715,276, Cl. 195-31.00f.
Takeda, Sadao: *See—*
Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,552.
Umezu, Shiro; Takeda, Sadao; Mitsudome, Kaoru; and Hashimura, Tetsuo, 3,715,554.
Takezaki, Tsuneo; and Miki, Sukeichi, to Matsushita Electric Industrial Co., Ltd. Signal seeking type auto-tuning television receiver. 3,715,495, Cl. 178-5.80a.
Takise, Tadashi; and Okada, Takashi, to Sony Corporation. Noise cancellation circuit. 3,715,488, Cl. 178-7.30s.
Takishima, Yoshiyuki: *See—*
Mashimo, Yukio; Mizui, Seiichiro; and Takishima, Yoshiyuki, 3,714,872.
Tallent, Othar K.: *See—*
Lloyd, Milton H.; Tallent, Othar K.; and Leuze, Rex E., 3,715,317.
Tamaru, Hideshi; and Ishigaki, Yoshio, to Sony Corporation. Color televeision receiver. 3,715,469, Cl. 178-5.40p.
Tan, Sing Liong, to U.S. Philips Corporation. Field-sequential colour television camera including a colour filter and one camera tube. 3,715,473, Cl. 178-5.4st.
Tanguy, Pierre; Carre, Pierre; and Le Boulbouech, Jean. Machine for cooking eggs and minced meats. 3,714,888, Cl. 99-355.000.
Tani, Norihiro: *See—*
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Tapeswitch Corporation of America: *See—*
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Fowell, Andrew J.; and Knebusch, George R. (said Fowell assor. to), 3,714,795.
Tartakoff, Alexander: *See—*
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Tassoney, Joseph P.; and Schlinger, Warren G. Multi-hydrotorting of coal. 3,715,195, Cl. 48-197.00r.
Tassoney, Joseph P.; and Schlinger, Warren G., to Texaco Inc. Multihydrotorting of coal. 3,715,301, Cl. 208-8.000.
Taylor, Richard P., to Mead Corporation, The. Multiple jet channel. 3,714,928, Cl. 118-624.000.
Teagno, Wladimiro; and Campari, Luigi, to AMP Incorporated, mesne. Two piece flat cable connector. 3,715,457, Cl. 174-88.00r.
Tech-Art, Inc.: *See—*
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Teeter, Ford C.; Sheldahl, David B.; and Highberg, Carle W., to Atlantic Richfield Company. Product. 3,715,312, Cl. 252-49.500.
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Nordin, Robert W., 3,715,020.
Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scraper chain conveyors and scraper elements. 3,715,025, Cl. 198-171.000.
Terkelsen, Bruce E., to United Aircraft Corporation. Method and apparatus for the production of directionally solidified castings. 3,714,977, Cl. 164-60.000.
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Thomas, Edward W.; and Rapkin, Edward, to Intertechnique S.A. Liquid scintillation spectrometry system for sample analysis. 3,715,586, Cl. 250-71.50r.
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Toman, Donald J., to Tull Aviation Corporation. Radio guidance system with separate transmission of a standard frequency signal to enhance the discrimination of the receiver. 3,715,757, Cl. 343-108.00r.
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Traubel, Harro; and Oertel, Harald, to Bayer Aktiengesellschaft. Using monoisocyanates to prepare microporous polyurethanes. 3,715,326, Cl. 260-2.5ay.
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Trevisiol, Franco; and Bergonzi, Mario, to AMP Incorporated, mesne. Rotary switch with double nosed contacts fixedly secured to stator section. 3,715,527, Cl. 200-11.00k.
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Tsuchiya, Seiji; Yabuki, Minoru; and Takada, Yoshinori, to Furukawa Electric Company Limited, The. Method and apparatus for continuously winding tape onto elongated body. 3,714,769, Cl. 57-3.000.
Tsuda, Jo, to Masakazu Inagaki & Tsuda, Jo. Steering wheel consisting of a light frame integrally moulding, processed from a flat plate. 3,714,844, Cl. 74-552.000.
Tsukagoshi, Tsunehiro, to Pioneer Electronic Corporation. Multi-track magnetic hall head. 3,715,522, Cl. 179-100.2ch.
Tsunoda, Yorio; and Takamatu, Shigeyuki, to Tokyo Shibaura Electric Co., Ltd. Induction liquid flow meter and method of electromagnetically determining the flow rate of liquid. 3,714,826, Cl. 73-194.0em.
Tucker, James Henry, to National Research Development Corporation. Apparatus for detecting irregularities in the light transmission properties of materials. 3,715,601, Cl. 250-222.00r.
Tuggle, Robert E., to General Motors Corporation. Shock absorbing bumper. 3,715,139, Cl. 293-70.000.
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Ueno, Sadayasu: *See—*
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Uhtenwoldt, Herbert R.; and Deranian, Diran, to Cincinnati Milacron-Heald Corporation. Grinding machine with SiZe controlled dressing means. 3,714,741, Cl. 51-165.910.
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Weingart, Jerome M.; and Yasui, Robert K. Stacked solar cell arrays. 3,715,600, Cl. 250-212.000.

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Upind, Calif., to FMCCorporation. Apparatus and method for handling volatile liquids. 371,479,002, Cl. 62-54.000.

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Ushijima, Fmihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for automatic transmissions. 3,714,847, Cl. 74-753.000.

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Van Dusen, Charles H., Jr.; and Brown, Paul, to Addressograph-Multigraph Corporation. Process of using multi-purpose lithographic solution. 3,714,891, Cl. 101-451.000.

Van Dyke, Roscoe H., to McDonnell Douglas Corporation. Auto-advance throttle control. 3,715,093, Cl. 244-76.00b.

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Van Tilberg, Jan, to American Can Company. Method of biaxially deforming sheet material. 3,714,687, Cl. 28-72.100.

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Van Vonderen, Jacobus, to Teledyne Inc. Film tension sensing system for use especially in electrically driven automatic step and repeat cameras. 3,715,091, Cl. 242-191.000.

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Vasseur, Jean-Pierre, to CSF-Compagnie Generale de Telegraphie Sans Fil. Secrecy facsimile system. 3,715,478, Cl. 178-5.100.

Venable, Charles R., Jr., to Phillips Petroleum Company. High temperature refractory lining. 3,714,971, Cl. 138-143.000.

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Villano, John A. Apparatus for milling cams and the like, as for swiss-type screw machine cams. 3,714,865, Cl. 90-13.00c.

Viret, Robert; and Pettavel, Jacques, to Societe Genevoise d'Instruments de Physique. High precision reading device of the graduation of a precision ruler. 3,715,645, Cl. 318-603.000.

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Vogelsberg, Robert E., to International Business Machines Corporation. Failure activity determination technique in fault simulation. 3,715,573, Cl. 235-153.0ac.

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Walker, James V., to McDonnell Douglas Corporation. Piston ring expander. 3,715,113, Cl. 267-65.000.

Walker, John B. Variable electric current generating device. 3,715,237, Cl. 136-89.000.

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Walsh, William J.; Livers, Joseph A.; Mueller, Robert S.; and Hill, Warren R., to Eaton Yale & Towne, Inc. Vehicle speed control. 3,715,006, Cl. 180-105.00e.

Walter, Heinz E., to Singer Company, The, mesne. DC control circuits for direct drive motors continuously coupled to sewing machines for controlling sewing functions. 3,715,642, Cl. 318-269.000.

Walton, John Hugh Davey. Analog computer for solving sets of simultaneous relations. 3,715,575, Cl. 235-180.000.

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Ward, John C. Gas appliance igniter for a mobile living unit. 3,715,182, Cl. 431-264.000.

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Watkinson, Leonard J.; and Service, Anthony Peter, to Howson-Algraphy Limited. Lithographic printing plates. 3,715,210, Cl. 96-33.000.

Watson, Timothy. Pulley with belt clamping means. 3,714,839, Cl. 74-230.240.

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Wean United, Inc.: *See—*
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Webb, Robert H., to Block Engineering, Inc. Applanation tonometer comprising porous air bearing support for applanating piston. 3,714,819, Cl. 73-80.000.

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Weber, Marvin J., to Raytheon Company. Coupled ion eye-safe laser. 3,715,683, Cl. 331-94.500.

Weber-Knapp Company: *See—*
Little, Carl H., 3,714,680.

Weichselbaum, Theodore E.; and Wilhelmson, Jack L., to Sherwood Medical Industries Inc. Identification system. 3,715,570, Cl. 235-61.12m.

Weiher, Richard L.: *See—*
Campbell, Donald A.; Packard, James R.; Tait, William C.; and Weiher, Richard L., 3,715,162.

Weimer, Paul Kessler, to RCA Corporation. Radiation sensing and signal transfer circuits. 3,715,485, Cl. 178-7.100.

Weinbaum, Sheldon; and Liner, Robert T., Jr., to General Electric Company. Gaseous nuclear rocket engine. 3,714,782, Cl. 60-203.000.

Weingart, Jerome M.: *See—*
United States of America, National Aeronautics and Space Administration, 3,715,600.

Weir, Stanley M., to FMC Corporation. Loading and unloading conveyor. 3,715,043, Cl. 214-38.00b.

Weiss, Anton G.: *See—*
Traber, Walter; and Weiss, Anton G., 3,715,315.

Weiss, Joseph, Jr. Quick dump hoist. 3,715,084, Cl. 242-54.000.

Weisz, William; and Herron, William L., to Singer Company, The. Ball hinges. 3,714,678, Cl. 16-128.00r.

Welch, Wilson A.: *See—*
Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., 3,715,578.

Welsh, James W.: *See—*
Teeple, Gifford H., Jr.; and Welsh, James W., 3,715,035.

Wendisch, Irmgard: *See—*
Maszumanski, Trude; and Wendisch, Irmgard, 3,715,151.

Wennerberg, Arnold N.; and Frazier, Alvin W., to Standard Oil Company. Hydrotreatment of fossil fuels. 3,715,303, Cl. 208-112.000.

Wenz, Adolf; Stein, Alfred; and Schmitt, Dieter, to Merck Patent Gesellschaft mit beschrankter Haftung. Indicator strip. 3,715,192, Cl. 23-253.0tp.

Werner, Georg: *See—*
Rix, Albert; Werner, Georg; and Fuchs, Hans, 3,715,022.

Wertheimer, Donald J.; Fish, Richard D.; and Holmes, Ralph A., to Long, F. S., Manufacturing Company. Broiler-grill cooking appliance. 3,714,885, Cl. 99-425.000.

West, James Edward: *See—*
Sessler, Gerhard Martin; and West, James Edward, 3,715,500.

Westbrook, Aubrey Joseph; and Thomson, Ian David Mac Knight, to Plastic Rotational Moulding Limited. Moulding apparatus. 3,715,179, Cl. 425-86.000.

Western Electric Company, Incorporated: *See—*
Krogel, Christopher John, 3,714,927.
McGrath, John W.; and Repsher, Dennis E., 3,715,576.

Westinghouse Electric Corporation: *See—*
Anderson, Melvin R., 3,715,707.
Blewitt, Donald D., 3,715,698.
Kernick, Andress; Ernsberger, Glenn W.; Vonderembse, John F.; and Geyer, Manvel A., 3,715,648.
Keto, August I.; and Manes, Robert J., 3,715,543.
Ravas, Richard J., 3,715,649.

Westley, John: *See—*
Stempel, Arthur; and Westley, John, 3,715,372.

Weston Instruments, Inc.: *See—*
Busch, Edward R.; and Wood, Guy B., 3,715,592.

Westram Corporation: *See—*
Dalton, Thomas B., 3,715,530.

Westwig, Ralph A.: *See—*
Love, Roy E.; and Westwig, Ralph A., 3,715,150.

Weyerhaeuser Company: *See—*
Dedrick, Dallas S., 3,714,716.

Wheat, Lawrence C.; and Tary, Orville L., to Libbey-Owens-Ford Company. Apparatus for producing all-glass multiple sheet glazing units. 3,715,198, Cl. 65-152.000.

Whetstone, Albert; Fine, Samuel; and Phillips, Stanley, to Science Accessories Corporation. Apparatus for making spark chamber wire arrays. 3,714,689, Cl. 29-25.200.

Whirlpool Corporation: *See—*
Linstromberg, William J.; and Nichols, Duane C., 3,714,794.

Whirpool Corporation: *See—*
Beard, William L., Jr.; and Hahn, Ronald E., 3,714,717.

White, Halbert C.; Strycker, Stanley J.; and Wysong, Don V., to Dow Chemical Company, The. Substituted 2-(2-imidazolin-2-ylthio) acetophenones. 3,715,367, Cl. 260-309.600.

White, James C.: *See—*
Hunsinger, Peter; and White, James C., 3,715,067.

White, Robert L.: *See—*
Thorsby, Claude A.; and White, Robert L., 3,715,114.

Whiting Corporation: *See—*
Rushton, William E.; Seavoy, Gordon E.; and Morey, Woodruff A., 3,715,191.

Wieczorek, Theophil J., to Enthone, Incorporated. Method for deoxidizing and descaling ferrous metals. 3,715,292, Cl. 204-145.00r.

Wiemann, Ronald W.: *See—*
Muskopf, Billy J.; and Wiemann, Ronald W., 3,715,072.

Wilhelmson, Jack L.: *See—*
Weichselbaum, Theodore E.; and Wilhelmson, Jack L., 3,715,570.

Wilkens, Henry W.; and Sabatino, Daniel D., to Flowtron Industries Inc. Fuel consumption meter. 3,714,823, Cl. 73-113.000.

Wilkus, Edward V.; and Berger, Abe, to General Electric Company. Xanthenyl ketone containing organosilicon materials. 3,715,370, Cl. 260-335.000.

Williams, Ralph L. Electrical discharge apparatus. 3,715,300, Cl. 204-312.000.

Williams, Roger Morley: *See—*
Stirling, Harold James; Williams, Roger Morley; Hampson, Peter Samuel; and Price, James Kenneth, 3,715,515.

Wilson, Gerald E., to Schlumberger Technology Corporation. Retrievable well packer. 3,714,983, Cl. 166-120.000.

Wilson, Harry R., to McQuay-Perfex Inc. Engine cooling system for vehicles. 3,715,001, Cl. 180-68.00r.

Wilson, Leon W., Jr.: *See—*
Browell, George L.; and Wilson, Leon W., Jr., 3,715,294.

Wilson, William C.: *See—*
Di Fulvio, Anthony P.; and Wilson, William C., 3,715,117.

Winkler, Frederic V. Hair stylists accessory tray or the like. 3,715,038, Cl. 211-128.000.

Winn, William C.: *See—*
Pierce, Stanley L., Jr.; and Winn, William C., 3,714,836.

Winters, Michael E.; and Han, Wyong S., to Uniroyal Inc. Wire reinforced rubber product. 3,715,266, Cl. 161-140.000.

Wisconsin Alumni Research Foundation, The: *See—*
De Luca, Hector F., 3,715,374.

Wise, Harold L. (: *See—*
Daigle, Edwin E.; Luke, Robert R.; Turner, James B.; and Wise, Harold L. (, 3,714,811.

Wise, Robert G., to Cincinnati Milacron Inc. Tracing feed rate steering control. 3,715,646, Cl. 318-632.000.

With, Bror. Ski binding with clamping bail. 3,715,127, Cl. 280-11.35b.

Witzel, Bruce E.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, to Merck & Co., Inc. Method of treating inflammation. 3,715,358, Cl. 260-263.000.

Wolgemuth, Larry G.; and Fritock, William H., to Atlantic Richfield Company. Process for the preparation of N-vinyl carbamic acid esters. 3,715,385, Cl. 260-482.00c.

Wolverine Industries, Inc.: *See—*
Drablowski, William J., 3,715,095.

Woo, James T. K.: *See—*
Nowak, Robert M.; Woo, James T. K.; and Heinert, Dietrich H., 3,715,336.

Wood, Guy B.: *See—*
Busch, Edward R.; and Wood, Guy B., 3,715,592.

Wood, Lowell L., Jr.: *See—*
Jensen, Carl A.; and Wood, Lowell L., Jr., 3,715,110.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,715,029, Cl. 206-65.00e.

Wood, Walter B.; Shuler, Bernard R.; Bromm, Charles A.; and Welch, Wilson A., to American Air Filter Company, Inc. Light and filter assembly for ceiling structure. 3,715,578, Cl. 240-9.00r.

Woodier, George H., to Curtiss-Wright Corporation. Fluid metering apparatus. 3,715,177, Cl. 418-171.000.

Woodland, Michael W.: *See—*
Dunaway, Jack W.; Woodland, Michael W.; and Johnson, Bernard H., 3,715,257.

Woodling, George V. Rotary valve component means. 3,715,175, Cl. 418-61.000.

Woodward, Oakley McDonald, to RCA Corporation. TM_{41} mode exciter and a multimode exciter using same. 3,715,688, Cl. 333-1.000.

Wooster Brush Company, The: *See—*
Davis, Howard C.; Pritz, Howard B.; and Burton, Charles A., 3,715,174.

Worcester, Joseph A., to General Electric Company. Multiple spreadband tuning in a varactor tuned radio receiver. 3,715,671, Cl. 325-468.000.

Worden, Donald A.: *See—*
Kowalski, Slawomir; and Worden, Donald A., 3,714,868.

Worden, William W. Means and method of producing an expanded cereal product. 3,714,886, Cl. 99-238.000.

Worthington, Harvey R., Jr., to Searle Medidator Inc. Projection apparatus for multiple-sector slide transparencies. 3,715,157, Cl. 353-25.000.

Wright, Edmund S., to Eltra Corporation. Production of basic refractories. 3,715,223, Cl. 106-59.000.

Wright, Harry Gilbert; and Dischert, Robert Adams, to RCA Corporation. Shuttering apparatus for television cameras. 3,715,486, Cl. 178-7.200.
Wright, Ian G.: *See—*
Spry, Douglas O.; and Wright, Ian G., 3,715,347.
Wuhrmann, Jean-Jacques; and Cristofaro, Elvira, to Societe d'Assistance Technique pour Produits Nestle S.A. Beverage composition. 3,715,216, Cl. 99-78.000.
Wysong, Don V.: *See—*
White, Halbert C.; Strycker, Stanley J.; and Wysong, Don V., 3,715,367.
Xerox Corporation: *See—*
Ciccarelli, Roger N., 3,715,207.
Gundlach, Robert W., 3,715,209.
Yabuki, Minoru: *See—*
Tsuchiya, Seiji; Yabuki, Minoru; and Takada, Yoshinori, 3,714,769.
Yamada, Kiichi. Special thermal electric power generating unit using pressurized hot air together with superheated steam. 3,714,960, Cl. 137-340.000.
Yamamoto, Masato: *See—*
Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.
Yamamoto, Michiaki: *See—*
Kobayashi, Shigehiko; Miyazaki, Kazuhide; and Yamamoto, Michiaki, 3,715,322.
Yamato Mishin Seizo Kabushiki Kaisha: *See—*
Masaki, Kazumi, 3,715,643.
Yamauchi, Sanji: *See—*
Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.
Yamazaki, Tsunehiro: *See—*
Fukui, Saburo; Yamazaki, Tsunehiro; Yamamoto, Masato; Miyake, Masuichi; and Okumoto, Masanori, 3,715,236.
Yanof, Howard M.; Pansky, Ben; and Poff, James S., said Poff assor. to said Yanof Pansky, Ben. Medicament injectors. 3,714,943, Cl. 128-173.00h.
Yarber, Harold Dean, to Stevens, J. P., & Co., Inc. Crimping rolls for thermoplastic materials. 3,714,685, Cl. 28-1.200.
Yasui, Robert K.: *See—*
United States of America, National Aeronautics and Space Administration, 3,715,600.
Yeda Research and Development Co., Ltd.: *See—*
Manassen, Joost; Vofsi, David; and Martan, Michael, 3,715,403.
Yeomans, Bertram, to BP Chemicals Limited. Production of dineodicarboxylic acids. 3,715,392, Cl. 260-537.00r.
Yokoyama, Taizo: *See—*
Nihyakumen, Kouzi; Yokoyama, Taizo; Ueda, Yasuo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,715,213.
Yokozeki, Zenzo; and Hatta, Takeshi, to Kurita Water Industries Ltd. Method and apparatus for preparation of aluminum coagulating agent. 3,715,290, Cl. 204-96.000.
Yoshida Kogyo Kabushiki Kaisha: *See—*
Fukuroi, Takeo, 3,714,698.
Yoshida, Tsukasa. Thickness-adjustable joint assembly for building use. 3,715,136, Cl. 287-189.36d.
Yoshida, Yoshio: *See—*
Wakamori, Shigeki; Yoshida, Yoshio; Yamauchi, Sanji; Ishii, Yoshio; and Goto, Muneharu, 3,715,199.
Yost, Edward F., Jr., to Spectral Data Corporation. Method of multispectral photography and protector. 3,714,875, Cl. 95-12.200.
Young, Charles Gilbert, to American Optical Corporation. Rectangular disc laser. 3,715,682, Cl. 331-94.50p.
Young, John P.: *See—*
Ng, Wahling H.; Lehman, William F.; and Young, John P., 3,715,231.
Young, Robert B., to AAI Corporation. Projectile, cartridge, and method. 3,714,896, Cl. 102-41.000.
Young, Robert W.; and Radler, Frederick J., to TRW Inc. Electric tuning electric wave filter. 3,715,690, Cl. 333-17.000.
Yperman, Jean Michel Baudry Ghislain; and Rapaille, Jean Rodolphe, to U.S. Philips Corporation. Non-linear resistance element. 3,715,701, Cl. 338-20.000.
Yu, Frank K., to Honeywell Inc. Control mechanism and bus for a data processing pooler system. 3,715,727, Cl. 340-172.500.
Yusa, Yasushi; Akai, Naotoshi; Satoh, Kimio; and Sekizawa, Yasuharu, to Meiji Seika Kaisha, Ltd. Parasiticide for animals. 3,715,431, Cl. 424-181.000.
Zacharias, Ellis M., Jr.; and Cirulis, Uldis, to Nusonics, Inc., mesne. Sing-around velocimeter. 3,715,709, Cl. 340-3.00e.
Zahn, Gunter, to Ziller & Co. Sealing ring arrangement for anti-friction bearings. 3,715,147, Cl. 308-187.200.
Zaugg, Roland; Glanzmann, Werner; and Fluck, Josef, to Schild, A., S.A. Correction mechanism for calendar watches. 3,714,774, Cl. 58-58.000.
Zenith Radio Corporation: *See—*
Adler, Robert, 3,715,524.
Ziemba, Richard T., to General Electric Company. Fuze actuating system. 3,714,898, Cl. 102-70.20r.
Ziller & Co.: *See—*
Zahn, Gunter, 3,715,147.
Zink, John, Company: *See—*
Zink, John Smith; Goodnight, Hershel; and Reed, Robert D., 3,715,181.
Zink, John Smith; Goodnight, Hershel; and Reed, Robert D., to Zink, John, Company. Fuel burner assembly. 3,715,181, Cl. 431-184.000.
Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung: *See—*
Rothke, Ernst, 3,714,770.
Zobler, Joy: *See—*
Zobler, Melvyn N.; and Zobler, Joy, 3,714,966.
Zobler, Melvyn N.; and Zobler, Joy. Flexible high pressure gas line connector for bunsen burners and the like. 3,714,966, Cl. 137-560.000.
Zoecon Corporation: *See—*
Diekman, John D., 3,715,363.
Zoerner, Richard L.; and Ruiter, Larry D., to Gardner-Denver Company. Fluid actuated impact mechanism. 3,714,994, Cl. 173-93.000.
Zumbrunn, Jean-Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for detoxicating waste waters charged with organic cyanide impurities. 3,715,309, Cl. 210-63.000.
Zupan, Frank M.; and Zurek, Jerome N., to Stewart-Warner Corporation. Siphon paint spray cup assembly. 3,714,967, Cl. 137-588.000.
Zuppiger, Paul, to Dunlop Holdings Limited & Battelle Memorial Institute. Conveyor handrails. 3,714,902, Cl. 104-25.000.
Zurek, Jerome N.: *See—*
Zupan, Frank M.; and Zurek, Jerome N., 3,714,967.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ackerman, Bernard, to Electro-Catheter Corp. Cardiac electrode catheter and heart stimulation method. Re. 27,569, 2–6–73, Cl. 128—418.

Austin, George E.: *See*—
Rawlings, Richard F., and Austin. Re. 27,577.

Ball, Jay H.: *See*—
Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.

Balon Corp.: *See*—
Scaramucci, Domer. Re. 27,570.

Brody, Donald E.: *See*—
Cain, Clifford W., Jr., and Brody. Re. 27,572.

Cain, Clifton W., Jr., and D. E. Brody, to Johns-Manville Corp. Diatomaceous silica pigments and the like. Re. 27,572, 2–6–73, Cl. 106—288.

Ditz-Crane: *See*—
Kough, John K. and B. B. Re. 27,574.

Dresser Industries, Inc.: *See*—
Youmans, Arthur H. Re. 27,579.

Electro-Catheter Corp.: *See*—
Ackerman, Bernard. R. 27,569.

Esso Research and Engineering Co.: *See*—
Kahn, Donald J., Robbins, and Furer. Re. 27,582.

Farbewerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See*—
Ribka, Joachim, and Pretzer. Re. 27,575.
Ribka, Joachim. Re. 27,576.

Ferguson, Joseph B.: *See*—
Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.

Furer, Frieder S.: *See*—
Kahn, Donald J., Robbins, and Furer. Re. 27,582.

Graham, James F. Surgical dressing. Re. 27,571, 2–6–73, Cl. 128—156.

Hjermstad, Erling T., L. C. Martin, and K. W. Kirby, to Penick & Ford, Ltd. Monofunctionally substituted hydrophobic starch and film-forming dispersions prepared therefrom. Re. 27,581, 2–6–73, Cl. 106—213.

Johns-Manville Corp.: *See*—
Cain, Clifford W., Jr., and Brody. Re. 27,572.

Kahn, Donald J., M. L. Robbins, and F. S. Furer, to Esso Research and Engineering Co. Metal-containing detergent-dispersants for lubricants. Re. 27,582, 2–6–73, Cl. 252—32.7.

Keeton, Eugene G. Seed planter. Re. 27,578, 2–6–73, Cl. 221—219.

Kirby, Kenneth W.: *See*—
Hjermstad, Erling T., Martin, and Kirby. Re. 27,581.

Kough, Blair B.: *See*—
Kough, John K. and B. B. Re. 27,574.

Kough, John K. and B. B., to Ditz-Crane. Blowback seal for building panels. Re. 27,574, 2–6–73, Cl. 52—541.

Kucera, Joseph B.; assignor of a fractional part interest to Rudolf L. Lowell. Machine and method for drying. Re. 27,573, 2–6–73, Cl. 34—20.

Lowell, Rudolf L.: *See*—
Kucera, Joseph B. Re. 27,573.

Martin, Larry C.: *See*—
Hjermstad, Erling T., Martin, and Kirby. Re. 27,581.

Penick & Ford, Ltd.: *See*—
Hjermstad, Erling T., Martin, and Kirby. Re. 27,581.

Pretzer, Wolfgang: *See*—
Ribka, Joachim, and Pretzer. Re. 27,575.

Rawlings, Richard F., and G. E. Austin; said Austin assignor to said Rawlings. Shell stringer apparatus. Re. 27,577, 2–6–73, Cl. 83—95.

Rawson, Edward B., D. B. Schwarzkopf, J. B. Ferguson, and J. H. Ball, to Searle Medidata Inc. Multiphasic medical screening system. Re. 27,580, 2–6–73, Cl. 340—172.5.

Ribka, Joachim, to Farbewerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-insoluble benzimidazolone containing monoazo dyestuffs. Re. 27,576, 2–6–73, Cl. 260—157.

Ribka, Joachim, and W. Pretzer, to Farbewerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-insoluble benzimidazolone containing monoazo dyestuffs. Re. 27,575, 2–6–73, Cl. 260—157.

Robbins, Max L.: *See*—
Kahn, Donald J., Robbins and Furer. Re. 27,582.

Scaramucci, Domer, to Balon Corp. Ball valve for use between flanges. Re. 27,570, 2–6–73, Cl. 251—151.

Schwarzkopf, Daniel B.: *See*—
Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.

Searle Medidata Inc.: *See*—
Rawson, Edward B., Schwarzkopf, Ferguson, and Ball. Re. 27,580.

Youmans, Arthur H., to Dresser Industries, Inc. Method of core analysis using thermal neutron capture cross section. Re. 27,579, 2–6–73, Cl. 250—83.1.

LIST OF PLANT PATENTEES

Duffett, William E.: *See*—
Maton, Arthur, Jessel, and Duffett. 3,300.

Duffett, William E., to Yoder Brothers, Inc. Carnation plant. 3,299, 2–6–73, Cl. 70.

Hawes, Ralph E. Carnation plant. 3,301, 2–6–73, Cl. 70.

Jessel, Walter H., Jr.: *See*—
Maton, Arthur, Jessel, and Duffett. 3,300.

Maton, Arthur, W. H. Jessel, Jr., and W. E. Duffett, to Webb Greenhouses, Inc. Chrysanthemum plant. 3,300, 2–6–73, Cl. 81.

Merrill, Grant. Peach tree. 3,298, 2–6–73, Cl. 43.

Sumruld, Roy. Plum tree. 3,297, 2–6–73, Cl. 38.

Webb Greenhouses, Inc.: *See*—
Maton, Arthur, Jessel, and Duffett. 3,300.

Yoder Brothers, Inc.: *See*—
Duffett, William E. 3,299.

LIST OF DESIGN PATENTEES

Abend, Chester J.: *See*—
Bienkowski, James J., and Abend. 226,292.

Anthony, David W., and R. C. Urie, to Stanley Home Products, Inc. Combination handle and hanger for a broom or brush. 226,252, 2–6–73, Cl. D4—4.

Anthony, David W., and R. C. Urie, to Stanley Home Products, Inc. Hairbrush. 226,253, 2–6–73, Cl. D4—31.

Bateman, Robert F., to Plastics, Inc. Tray. 226,284, 2–6–73, Cl. D44—10.

Bateman, Robert F., to Plastics, Inc. Interlocking tray. 226,285, 2–6–73, Cl. D44—10.

Bee, James W. M.: *See*—
Tyson, John F., and Bee. 226,273.

Bienkowski, James J., and C. J. Abend, to SCM Corp. Typewriter carrying case. 226,292, 2–6–73, Cl. D87—1.

Bizzaro, William, Jr. Mobile home. 226,263, 2–6–73, Cl. D14—3.

British & International Proprietaries Ltd.: *See*—
Greif, Francis. 226,288.

Bullard, E. D., Co.: *See*—
Raschke, Herbert A. 226,251.

Callaghan, John D., and R. Kaysen, to RCA Corp. Indoor antenna or similar article. 226,274, 2–6–73, Cl. D26—14.

Cohen, Charles H., and V. F. Leonard, to Goldberg Plastics, Inc. Catheter. 226,290, 2–6–73, Cl. D83—12.

Consolidated Foods Corp.: *See*—
Gebhart, George. 226,291.

Educational Supply Association, Ltd., The: *See*—
Shield, John G. 226,283.

Eyerly, Eugene B., to Law Hammer, Inc. Disassemblable tree ball transporter. 226,279, 2–6–73, Cl. D35—1.

Gebhart, George, to Consolidated Foods Corp. Combined hair roller and adjustable hair holding band. 226,291, 2–6–73, Cl. D86—10.

Gilbrech, Donald A. Fork lift vehicle. 226,264, 2–6–73, Cl. D14—3.

Gnader, Rachel. Pocket insert for filing folder. 226,294, 2–6–73, Cl. D74—2.

Goldberg Plastics, Inc.: *See*—
Cohen, Charles H., and Leonard. 226,290.

Grief, Francis, to British & International Proprietaries Ltd. Telephone index. 226,288, 2–6–73, Cl. D74—1.

Guhl, Jay R.; assignor of a fractional part interest to Dean W. Park. Bale wire tying and cinching tool. 226,256, 2–6–73, Cl. D8—44.

Hanamura, Kenji, to Tancho Co., Ltd. Squeeze tube or the like. 226,260, 2–6–73, Cl. D9—194.

Hanson-Hawk, Inc.: *See*—
Holtzman, Norman. 226,271.

Heinz, Richard: *See*—
Spellier, Roland. 226,267.
Henney, Alma A. Toy clown figure. 226,276, 2–6–73, Cl. D34—4.
Holtzman, Norman, to Hanson-Hawk, Inc. Multimeter casing. 226,271, 2–6–73, Cl. D26—1.
Horgan, William J., Jr. Door. 226,261, 2–6–73, Cl. D13—1.
Ishii, Hideki, to Kabushiki Kaisha Ricoh. Electronic calculator. 226,272, 2–6–73, Cl. D26—5.
Kabushiki Kaisha Ricoh: *See*—
Sakuma, Masayuki. 226,270.
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Kawamata, Isamu. Ice shaver. 226,293, 2–6–73, Cl. D89—1.
Kaysen, Raymond: *See*—
Callaghan, John D., and Kaysen. 226,274.
Kubick, Mark: *See*—
Melnick, Dennis M., and Kubick. 226,265.
Law Hammer, Inc.: *See*—
Eyerly, Eugene B. 226,279.
Leonard, Vernon F.: *See*—
Cohen, Charles H., and Leonard. 226,290.
Lisk Enterprises Corp.: *See*—
Lisk, Leard E., Jr. 226,259.
Lisk, Leard E., Jr., to Lisk Enterprises Corp. Container for liquids. 226,259, 2–6–73, Cl. D9—175.
Lombardo, Samuel. Golf club. 226,278, 2–6–73, Cl. D34—5.
Lowe, Leroy C. Time indicator for cooking. 226,281, 2–6–73, Cl. D52—6.
Melnick, Dennis M., and M. Kubick, to Pallet Development, Inc. Pallet. 226,265, 2–6–73, Cl. D14—3.
Minter, Alan H. Broock or similar article. 226,280, 2–6–73, Cl. D45—19.
National Machine Products Ltd.: *See*—
Williamson, John K. 226,255.
Northern Electric Co., Ltd.: *See*—
Tyson, John F., and Bee. 226,273.
Pallet Development, Inc.: *See*—
Melnick, Dennis M., and Kubick. 226,265.
Park, Dean W.: *See*—
Guhl, Jay R. 226,256.
Plastics, Inc.: *See*—
Bateman, Robert F. 226,284.
Bateman, Robert F. 226,285.
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Callaghan, John D., and Kaysen. 226,274.
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Shiman, Daniel. 226,286.
Shiman, Daniel, to Shiman Industries, Inc. Finger ring. 226,286, 2–6–73, Cl. D45—10.
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Hanamura, Kenji. 226,260.
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CLASS 2
3C 3,714,668
46 3,714,669
197 3,714,670

CLASS 3
1 3,714,671

CLASS 4
185L 3,714,672

CLASS 8
111 3,715,184
142 3,715,186
194 3,715,185

CLASS 13
18 3,715,439
3,715,440
26 3,715,441

CLASS 15
104.1R 3,714,673
230.11 3,714,674
244CH 3,714,675
312R 3,714,676

CLASS 16
62 3,714,677
128R 3,714,678
131 3,714,679
190 3,714,680

CLASS 17
1R 3,714,681
11 3,714,682
66 3,715,229

CLASS 23
230B 3,715,188
252R 3,715,190
253TP 3,715,192
259 3,715,189
260 3,715,191
288R 3,715,193
301SP 3,715,194

CLASS 24
205.1C 3,714,683
230AM 3,714,684

CLASS 28
1.2 3,714,685
1.4 3,714,686
72.1 3,714,687

CLASS 29
21.1 3,714,688
25.15 3,714,691
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129 3,714,692
132 3,714,693
148.4R 3,714,694
157C 3,714,695
200P 3,714,696
239 3,714,697
241 3,714,699
408 3,714,698
419 3,714,700
474.1 3,714,701
494 3,714,702
560 3,714,703
569 3,714,704
596 3,714,705
604 3,714,707
624 3,714,706
3,714,708
626 3,714,709

CLASS 30
34.1 3,714,710
43.92 3,714,711
95 3,714,712

CLASS 33
23K 3,714,713
80 3,714,714
174R 3,714,715

CLASS 34
20 Re.27,573
30 3,714,716
45 3,714,717
74 3,714,719
120 3,714,720

CLASS 35
8 3,714,722
9A 3,714,723
9R 3,714,721

CLASS 40
11 3,714,724
84 3,714,725

CLASS 42
74 3,714,726
79 3,714,727
84 3,714,728

CLASS 43
4.5 3,714,729
17.2 3,714,730
43.11 3,714,731
53.5 3,714,732
121 3,714,733

CLASS 46
76R 3,714,734

CLASS 48
197R 3,715,195

CLASS 49
220 3,714,735
237 3,714,736
360 3,714,737
404 3,714,738
501 3,714,739

CLASS 51
33W 3,714,740
165.91 3,714,741
246 3,714,742
392 3,714,743

CLASS 52
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28 3,714,744
36 3,714,748
69 3,714,746
70 3,714,749
309 3,714,747
400 3,714,751
484 3,714,753
541 Re.27,574
665 3,714,752
728 3,714,750

CLASS 53
22B 3,714,754
39 3,714,758
42 3,714,755
48 3,714,756
75 3,714,757
78 3,714,759
112R 3,714,760
118 3,714,761

CLASS 55
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163 3,714,763
235 3,714,764
472 3,714,765

CLASS 56
208 3,714,767
328R 3,714,768
364 3,714,766

CLASS 57
3 3,714,769
52 3,714,770
77.42 3,714,771
153 3,714,772

CLASS 58
28B 3,714,773
50R 3,714,867
58 3,714,774
90R 3,714,775

CLASS 59
23 3,714,776

CLASS 60
39.31 3,714,779
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39.74R 3,714,778
54.5R 3,714,781
54.6R 3,714,780
203 3,714,782
207 3,714,783
241 3,714,784
258 3,714,785

CLASS 61
11 3,714,786
46.5 3,714,788
53.5 3,714,789
53.7 3,714,787

CLASS 62
54 3,714,790
58 3,714,791
3,714,792
62 3,714,793
137 3,714,794
508 3,714,795
514 3,714,796

CLASS 64
8 3,714,797
21 3,714,798

CLASS 65
33 3,715,196
54 3,715,197
152 3,715,198

CLASS 66
140S 3,714,799
147 3,714,800
170 3,714,801

CLASS 70
34 3,714,802
58 3,714,803
419 3,714,804

CLASS 71
101 3,715,199

CLASS 72
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19 3,714,806
55 3,714,807
325 3,714,808
326 3,714,809
391 3,714,810

CLASS 73
19 3,714,811
23.1 3,714,812
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54 3,714,814
64.1 3,714,815
71.5 3,714,816
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73 3,714,818
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117.4 3,714,824
147 3,714,827
178T 3,714,825
194EM 3,714,826
194R 3,714,828
398R 3,714,829
425.4R 3,714,830
431 3,714,831
432SD 3,714,833
432R 3,714,832

CLASS 74
6 3,714,834
10.33 3,714,835
15.4 3,715,704
125.5 3,714,837
230.24 3,714,838
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492 3,714,841
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869 3,714,849

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10 3,715,200
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58 3,715,202
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84.1R 3,715,204
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170 3,715,206

CLASS 76
104 3,714,850

CLASS 81
15.7 3,714,851
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CLASS 82
2.5 3,714,853
101R 3,714,854

CLASS 83
1 3,714,855
95 Re.27,577
211 3,714,858
453 3,714,856
468 3,714,857
831 3,714,974

CLASS 84
1.01 3,715,442
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1.13 3,715,445
1.15 3,715,446
1.24 3,715,447
375 3,715,448

CLASS 85
1R 3,714,859

CLASS 86
23 3,714,860

CLASS 87
8 3,714,862
51 3,714,861

CLASS 89
1R 3,714,863
14C 3,714,864

CLASS 90
13C 3,714,865

CLASS 91
216R 3,714,866
420 3,714,868
434 3,714,869

CLASS 92
140 3,714,870

CLASS 95
10CE 3,714,872
10CT 3,714,873
10C 3,714,871
11.5R 3,714,874
12.2 3,714,875
13 3,714,876
31FM 3,714,877
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3,714,879
63 3,714,880
89R 3,714,881
3,714,882
94R 3,714,883

CLASS 96
1.2 3,715,209
1.5 3,715,207
4 3,715,208
33 3,715,210
35.1 3,715,211
48 3,715,212
49 3,715,213
66HD 3,715,214

CLASS 98
40D 3,714,884

CLASS 99
68 3,715,215
78 3,715,216
82 3,714,886
140R 3,715,217
174 3,715,218
239 3,714,887
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411 3,714,889
425 3,714,885

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229A 3,714,890

CLASS 101
93C 3,714,892
228 3,714,893
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451 3,714,891

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70.2R 3,714,898
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93 3,714,900

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25 3,714,902
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202 3,714,904

CLASS 105
197DB 3,714,905

CLASS 106
22 3,715,219
39.7 3,715,220
47Q 3,715,221
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213 Re.27,581
288B Re.27,572

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64 3,714,906
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157 3,714,908

CLASS 109
1S 3,714,909
73 3,714,910

CLASS 110
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8A 3,714,912
8R 3,714,914

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218R 3,714,916

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67A 3,714,918

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18R 3,714,920
28R 3,714,921

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14 3,714,922
114 3,714,923
115.5 3,714,924

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37R 3,715,227
46FC 3,715,228
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126GB 3,715,233
217 3,715,234

CLASS 118
49 3,714,925
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612 3,714,927
624 3,714,928

CLASS 119
80 3,714,929

CLASS 123
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41.79 3,714,931
75E 3,714,932
122D 3,714,933
139AW 3,714,934
140R 3,714,935
3,714,936

CLASS 126
25R 3,714,937
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CLASS 127
46A 3,715,235

CLASS 128
2.05A 3,714,939
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142 3,714,942
145.8 3,714,941
156 Re.27,571
173H 3,714,943
209 3,714,944
214.4 3,714,945
295 3,714,946
400 3,714,947
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CLASS 130
5R 3,714,948

CLASS 131
10.5 3,714,949

CLASS 132
112 3,714,950

CLASS 134
2 3,715,236
167C 3,714,951

CLASS 136
89 3,715,237
120FC 3,715,238
133 3,715,239
134P 3,715,240
237 3,715,241

CLASS 137
1 3,714,952
14 3,714,953
238 3,714,956
244 3,714,957
315 3,714,958
318 3,714,959
340 3,714,960
363 3,714,961
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487.5 3,714,963
513.3 3,714,964
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588 3,714,967
596.2 3,714,968
630.15 3,714,969
829 3,714,954
839 3,714,955

CLASS 138
109 3,714,970
143 3,714,971

CLASS 139
336 3,714,972

CLASS 140
92.1 3,714,973

CLASS 148
11.5R 3,715,243
11.5 3,715,242
31.5 3,715,244
171 3,715,245

CLASS 149
19 3,715,246
21 3,715,247
39 3,715,248

CLASS 152
228 3,714,976
243 3,714,975

CLASS 156
17 3,715,249
22 3,715,250
62.8 3,715,251
162 3,715,252
175 3,715,253
180 3,715,254
189 3,715,255
244 3,715,256
299 3,715,257
356 3,715,258
363 3,715,259
477B 3,715,260
541 3,715,262
552 3,715,261

CLASS 161
33 3,715,263
82 3,715,264
125 3,715,265
140 3,715,266
165 3,715,267

CLASS 162
72 3,715,268

CLASS 164
60 3,714,977

CLASS 165
1 3,714,978
3,714,979
11 3,714,980
47 3,714,981
55 3,714,982

CLASS 166
120 3,714,983
134 3,714,984
303 3,714,985

CLASS 169
1A 3,714,986
2A 3,714,987
13 3,714,988
19 3,714,989

CLASS 172
58 3,714,990
130 3,714,991
175 3,714,992

CLASS 173
78 3,714,993
93 3,714,994

CLASS 174
11BH 3,715,449
15C 3,715,451
3,715,452
3,715,453
28 3,715,532
47 3,715,454
48 3,715,455
59 3,715,450
84C 3,715,456
88R 3,715,457
113R 3,715,458
138F 3,715,459
158R 3,715,460

CLASS 175
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6 3,714,996

CLASS 176
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38 3,715,270
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67 3,715,273
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CLASS 177
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CLASS 178
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5.1 3,715,478
5.2R 3,715,461
5.4CD 3,715,468
3,715,474
5.4CR 3,715,462
5.4HE 3,715,467
3,715,471
3,715,472
3,715,479
5.4MC 3,715,463
5.4OP 3,715,469
5.4ST 3,715,465
3,715,466
3,715,473
5.4R 3,715,464
3,715,470
3,715,477
5.8A 3,715,495
6 3,715,476
3,715,480
6.6FS 3,715,481
6.7R 3,715,482
6.8 3,715,483
3,715,484
3,715,497
7.1 3,715,485
3,715,489
7.2 3,715,486
3,715,490
7.25 3,715,491
7.3R 3,715,492
3,715,493
7.3S 3,715,488
7.3 3,715,487
7.5D 3,715,494
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69.5TV 3,715,499
69.5F 3,715,498

CLASS 179
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1SA 3,715,512
1D 3,715,501
2C 3,715,502
6AC 3,715,504
6E 3,715,506
15AQ 3,715,505
15BC 3,715,508
15BF 3,715,503
15BM 3,715,510
15BY 3,715,507
15.55T 3,715,509
16E 3,715,511
18AD 3,715,513
18FA 3,715,516
18FF 3,715,515
18HB 3,715,517
81E 3,715,514
84VF 3,715,518
90A 3,715,520
100C 3,715,519
100.2CA 3,715,523
100.2CH 3,715,522
100.2P 3,715,521
100.3V 3,715,524
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CLASS 180
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8R 3,715,000
68R 3,715,001
82 3,715,002
103 3,715,003
3,715,004
3,715,005
105E 3,715,006

CLASS 181
.5NC 3,715,007
31B 3,715,008
33HC 3,715,009
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CLASS 182
100 3,715,011
107 3,715,012

CLASS 184
7D 3,715,013

CLASS 187
9 3,715,014

CLASS 188
5 3,715,015
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CLASS 191
12.2R 3,715,526

CLASS 192
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24 3,715,018
67A 3,715,019

CLASS 195
31F 3,715,276
63 3,715,277
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104 3,715,281

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1R 3,715,020
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98 3,715,022
3,715,023

CLASS 198
33AA 3,715,024
171 3,715,025
177 3,715,026
184 3,715,027

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19R 3,715,528
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46 3,715,529
47 3,715,530
61.52 3,715,533
61.53 3,715,535
61.64 3,715,536
61.7 3,715,537
67G 3,715,534
82D 3,715,538
84C 3,715,539
86R 3,715,541
148R 3,715,542
151 3,715,543
157 3,715,544
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159R 3,715,540
166BB 3,715,547
166C 3,715,546
167R 3,715,548
172A 3,715,549

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CLASS 203
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CLASS 204
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38A 3,715,288
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96 3,715,290
109 3,715,291
145R 3,715,292
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195R 3,715,296
212 3,715,299
301 3,715,287
312 3,715,300

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8 3,715,028
65E 3,715,029

CLASS 207
221R 3,715,030

CLASS 208
8 3,715,301
14 3,715,302
112 3,715,303

CLASS 209
75 3,715,031

CLASS 210
3 3,715,304
19 3,715,305
21 3,715,306
58 3,715,307
60 3,715,308
63 3,715,309
133 3,715,032
193 3,715,033
242 3,715,034
249 3,715,035
321 3,715,036
501 3,715,037

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128 3,715,038

CLASS 212
55 3,715,039

CLASS 214
16B 3,715,048
16.4R 3,715,040
17CA 3,715,041
38B 3,715,043
86A 3,715,042
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655 3,715,045
674 3,715,046

CLASS 215
47 3,715,047

CLASS 219
10.49 3,715,550
10.55 3,715,551
3,715,552
3,715,553
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3,715,555
10.69 3,715,556
62 3,715,557
82 3,715,558
126 3,715,559
131R 3,715,560
145 3,715,561
210 3,715,563
274 3,715,565
322 3,715,566
437 3,715,567

CLASS 220
39R 3,715,075
44R 3,715,049
54 3,715,050
3,715,051
3,715,052
55R 3,715,053
67 3,715,054

CLASS 221
75 3,715,055
211 3,715,056
3,715,057
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CLASS 222
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199 3,715,059
207 3,715,060
241 3,715,119
334 3,715,061
340 3,715,062
545 3,715,063

CLASS 223
57 3,715,064
111 3,715,065

CLASS 224
42.24 3,715,066

CLASS 225
96.5 3,715,067

CLASS 226
108 3,715,068

CLASS 227
130 3,715,069

CLASS 228
44 3,715,070

CLASS 229
2.5 3,715,071
15 3,715,072
43 3,715,073
57 3,715,074

CLASS 235
61.11D 3,715,569
61.12M 3,715,570
61.7R 3,715,568
150.2 3,715,571
3,715,572
150.31 3,715,562
153AC 3,715,573
154 3,715,574
180 3,715,575

CLASS 239
8 3,715,076
206 3,715,078
265.17 3,715,079
444 3,715,080
573 3,715,081

CLASS 240
2R 3,715,576
9R 3,715,578

CLASS 241
1 3,715,082
24 3,715,083

CLASS 242
54 3,715,084
56R 3,715,085
67.3R 3,715,087
67.3 3,715,086
74 3,715,088
129.5 3,715,089
188 3,715,090
191 3,715,091

CLASS 244
1SS 3,715,092
76B 3,715,093
83B 3,715,094

CLASS 246
187A 3,715,579

CLASS 248
46 3,715,095
223 3,715,096
449 3,715,097

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41.9ME 3,715,581
49.5TE 3,715,580
49.5A 3,715,582
50 3,715,587
71R 3,715,583
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71.5R 3,715,584
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71.5S 3,715,588
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83.1 Re.27,579
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83.3D 3,715,592
83.3H 3,715,591
83.3R 3,715,590
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84 3,715,596
84.5 3,715,595
105 3,715,597
106T 3,715,598
212 3,715,600
222R 3,715,601
231R 3,715,599

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121 3,715,098
149.1 3,715,099
151 Re.27,570

CLASS 252
8.1 3,715,310
32.7E Re.27,582
49.5 3,715,312
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52 3,715,313
95 3,715,314
106 3,715,315
188 3,715,316
301.1R 3,715,318
301.1S 3,715,317
319 3,715,319
441 3,715,321
454 3,715,322
529 3,715,324

CLASS 254
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47 : 3,714,702
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48 : Re.27,579
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51 : 3,714,720
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53 : Re.27,577
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27 : 226,284
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36 : 226,292
37 : 226,259
42 : 226,261

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6 : 3,297	3,298	17 : 3,300	25 : 3,301	39 : 3,299

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